Octafluorocyclobutane (RC318)
Safety Data Sheet P-4671


Date of issue: 01/01/1979   Revision date: 10/24/2016   Supersedes: 01/28/2015

**SECTION: 1. Product and company identification**

1.1. **Product identifier**

- **Product form**: Substance
- **Name**: Octafluorocyclobutane (RC318)
- **CAS No**: 115-25-3
- **Formula**: C₄F₈
- **Other means of identification**: OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)

1.2. **Relevant identified uses of the substance or mixture and uses advised against**

- **Use of the substance/mixture**: Industrial use. Use as directed.

1.3. **Details of the supplier of the safety data sheet**

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. **Emergency telephone number**

- **Emergency number**: Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

**SECTION 2: Hazard identification**

2.1. **Classification of the substance or mixture**

- **GHS-US classification**: Liquefied gas  H280

2.2. **Label elements**

- **GHS-US labeling**

  - **Hazard pictograms (GHS-US)**
  
  ![GHS04](image)

  - **Signal word (GHS-US)**: WARNING
  - **Hazard statements (GHS-US)**: H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
  OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
  CGA-HG01 - MAY CAUSE FROSTBITE

  - **Precautionary statements (GHS-US)**: P202 - Do not handle until all safety precautions have been read and understood
  P262 - Do not get in eyes, on skin, or on clothing
  P271+P403 - Use and store only outdoors or in a well-ventilated place
  CGA-PG05 - Use a back flow preventive device in the piping
  CGA-PG06 - Close valve after each use and when empty
  CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

2.3. **Other hazards**

- **Other hazards not contributing to the classification**: Asphyxiant in high concentrations.

2.4. **Unknown acute toxicity (GHS US)**

No data available
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SECTION 3: Composition/Information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Octafluorocyclobutane (RC318)</td>
<td>(CAS No) 115-25-3</td>
<td>100</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact: The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion: Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Reactivity: No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions: Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting: Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters: Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Specific methods: Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems

Stop flow of product if safe to do so

Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release.
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6.1.1. For non-emergency personnel
No additional information available

6.1.2. For emergency responders
No additional information available

6.2. Environmental precautions
Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up
No additional information available

6.4. Reference to other sections
See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling: Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)
None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Exposure controls
Appropriate engineering controls: Use in a closed system.
Hand protection: Wear working gloves when handling gas containers.
Eye protection: Wear safety glasses with side shields. Wear safety glasses with side shields or goggles when transfilling or breaking transfer connections.
**SECTION 9: Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Gas</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>200 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Ethereal. Poor warning properties at low concentrations.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Odor threshold is subjective and inadequate to warn for overexposure.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (ether=1)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point</td>
<td>-40.2 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>-5.8 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Critical temperature</td>
<td>114.8 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>270 kPa</td>
</tr>
<tr>
<td>Critical pressure</td>
<td>2784 kPa</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.6</td>
</tr>
<tr>
<td>Relative density of saturated gas/air mixture</td>
<td>6.907</td>
</tr>
<tr>
<td>Relative gas density</td>
<td>6.9</td>
</tr>
<tr>
<td>Solubility</td>
<td>Water: 140 mg/l</td>
</tr>
<tr>
<td>Log Pow</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Log Kow</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>None</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>Non flammable</td>
</tr>
</tbody>
</table>

**9.2. Other information**

- Gas group: Liquefied gas
- Additional information: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

**SECTION 10: Stability and reactivity**

**10.1. Reactivity**

No reactivity hazard other than the effects described in sub-sections below.

**10.2. Chemical stability**

Stable under normal conditions.

**10.3. Possibility of hazardous reactions**

None.
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### 10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials

Polystyrene. Alloys with >2% magnesium in the presence of water.

### 10.6. Hazardous decomposition products


### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general: No data available. No ecological damage caused by this product.

#### 12.2. Persistence and degradability

No additional information available

#### 12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Octafluorocyclobutane (RC318) (115-25-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pow</td>
</tr>
<tr>
<td>Log Kow</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Octafluorocyclobutane (RC318) (115-25-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility in soil</td>
</tr>
<tr>
<td>Ecology - soil</td>
</tr>
</tbody>
</table>

#### 12.5. Other adverse effects

| Effect on ozone layer                  | None |
| Global warming potential [CO2=1]       | 10300 |
| Effect on the global warming           | Contains Fluorinated greenhouse gases covered by the Kyoto protocol |

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Waste treatment methods: Do not discharge into any place where its accumulation could be dangerous. Refer to the supplier’s waste gas recovery program.
**SECTION 14: Transport information**

In accordance with DOT

- **Transport document description**: UN1976 Octafluorocyclobutane, 2.2
- **UN-No.(DOT)**: UN1976
- **Proper Shipping Name (DOT)**: Octafluorocyclobutane
- **Class (DOT)**: 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
- **Hazard labels (DOT)**: 2.2 - Non-flammable gas

**DOT Special Provisions (49 CFR 172.102)**: T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

**Additional information**

- **Emergency Response Guide (ERG) Number**: 126
- **Other information**: No supplementary information available.
- **Special transport precautions**: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:
  - Ensure there is adequate ventilation.
  - Ensure that containers are firmly secured.
  - Ensure cylinder valve is closed and not leaking.
  - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
  - Ensure valve protection device (where provided) is correctly fitted.

**Transport by sea**

- **UN-No. (IMDG)**: 1976
- **Proper Shipping Name (IMDG)**: OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)
- **Class (IMDG)**: 2 - Gases
- **MFAG-No**: 126

**Air transport**

- **UN-No. (IATA)**: 1976
- **Proper Shipping Name (IATA)**: Octafluorocyclobutane
- **Class (IATA)**: 2
- **Civil Aeronautics Law**: Gases under pressure/Gases nonflammable nontoxic under pressure

**SECTION 15: Regulatory information**

15.1. **US Federal regulations**

<table>
<thead>
<tr>
<th><strong>Octafluorocyclobutane (RC318) (115-25-3)</strong></th>
<th>Listed on the United States TSCA (Toxic Substances Control Act) inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SARA Section 311/312 Hazard Classes</strong></td>
<td>Immediate (acute) health hazard</td>
</tr>
<tr>
<td><strong>Immediate (acute) health hazard</strong></td>
<td>Sudden release of pressure hazard</td>
</tr>
</tbody>
</table>

15.2. **International regulations**

**CANADA**

<table>
<thead>
<tr>
<th><strong>Octafluorocyclobutane (RC318) (115-25-3)</strong></th>
<th>Listed on the Canadian DSL (Domestic Substances List)</th>
</tr>
</thead>
</table>

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EU-Regulations

Octafluorocyclobutane (RC318) (115-25-3)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2. National regulations
Octafluorocyclobutane (RC318) (115-25-3)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations
Octafluorocyclobutane (RC318)(115-25-3)

<table>
<thead>
<tr>
<th>State or local regulations</th>
<th>U.S. - New Jersey - Right to Know Hazardous Substance List</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
<td>No</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Developmental</td>
<td>No</td>
</tr>
<tr>
<td>Toxicity</td>
<td></td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive</td>
<td>No</td>
</tr>
<tr>
<td>Toxicity - Female</td>
<td></td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive</td>
<td>No</td>
</tr>
<tr>
<td>Toxicity - Male</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 16: Other information

Other information:
When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product.

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NFPA health hazard: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard: 0 - Materials that will not burn.
NFPA reactivity: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

**HMIS III Rating**
Health: 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability: 0 Minimal Hazard
Physical: 2 Moderate Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.