

### SECTION 1: Identification

#### 1.1. Product identifier

|                               |  |
|-------------------------------|--|
| Product form                  | : Substance  |
| Name                          | : Halocarbon R134A   |
| CAS No                        | : 811-97-2   |
| Formula                       | : C <sub>2</sub> H <sub>2</sub> F <sub>4</sub>                                 |
| Other means of identification | : Halocarbon 134a, Dymel 134a, refrigerant gas 134a, 1,1,1,2-tetrafluoroethane |
| Product group                 | : Core Products  |

#### 1.2. Recommended use and restrictions on use

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| Recommended uses and restrictions | : Industrial use<br>Use as directed |
|-----------------------------------|-------------------------------------|

#### 1.3. Supplier

Praxair Canada inc.  
1200 – 1 City Centre Drive  
Mississauga - Canada L5B 1M2  
T 1-905-803-1600 - F 1-905-803-1682  
[www.praxair.ca](http://www.praxair.ca)

#### 1.4. Emergency telephone number

|                  |  |
|------------------|--|
| Emergency number | : 1-800-363-0042<br>Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product.<br>For routine information, contact your supplier or Praxair sales representative. |
|------------------|--|

### SECTION 2: Hazard identification

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

##### GHS-CA classification

|                   |      |
|-------------------|------|
| Simple asphyxiant | H380 |
| Compressed gas    | H280 |

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-CA labelling

Hazard pictograms



GHS04

Signal word

: WARNING

Hazard statements

: CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

Precautionary statements

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

#### 2.3. Other hazards

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



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classification

### 2.4. Unknown acute toxicity (GHS-CA)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

| Name                                   | CAS No.           | % (Vol.) | Common Name (synonyms)  |
|--|-------------------|----------|---|
| Halocarbon R134A<br>(Main constituent) | (CAS No) 811-97-2 | 100      | Ethane, 1,1,1,2-tetrafluoro- / HFC 134a / Freon 134a / Refrigerant gas R 134a / Refrigerant gas R134a / Tetrafluoroethane, 1,1,1,2- / HFC-134a / Norflurane |

### 3.2. Mixtures

Not applicable

## 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.. Get immediate medical attention.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects (acute and delayed)

No additional information available

### 4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

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

### 5.2. Unsuitable extinguishing media

No additional information available

### 5.3. Specific hazards arising from the hazardous product

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

### 5.4. Special protective equipment and precautions for fire-fighters

- 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 their provincial and local fire code regulations.
- Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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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 : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release. Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

#### 6.2. Methods and materials for containment and cleaning up

Methods for cleaning up : This material is an Asphyxiant Gas. Any leaks should be handled by Emergency Response personnel. For assistance call your supplier.

#### 6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

### 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.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure exposure is below occupational exposure limits (where available). Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Provide adequate general and local exhaust ventilation. Consider work permit system e.g. for maintenance activities.

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### 8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.



Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : None necessary.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information : **Other protection** : Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

## SECTION 9: Physical and chemical properties

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

|   |   |
|---|---|
| Physical state                                | : Gas   |
| Appearance                                    | : No data available   |
| Molecular mass                                | : 102 g/mol   |
| Colour  | : Colourless.   |
| Odour   | : Ethereal.   |
| Odour threshold                               | : Odour threshold is subjective and inadequate to warn of overexposure. |
| pH  | : Not applicable.   |
| pH solution                                   | : No data available   |
| Relative evaporation rate (butylacetate=1)    | : No data available   |
| Relative evaporation rate (ether=1)           | : Not applicable.   |
| Melting point                                 | : -101 °C   |
| Freezing point                                | : -103 °C   |
| Boiling point                                 | : -26.6 °C  |
| Flash point                                   | : Not applicable.   |
| Critical temperature                          | : 101.1 °C  |
| Auto-ignition temperature                     | : Not applicable.   |
| Decomposition temperature                     | : No data available   |
| Vapour pressure                               | : 592 kPa absolute at 70°F (21.1°C)                                     |
| Vapour pressure at 50 °C                      | : No data available   |
| Critical pressure                             | : 4070 kPa  |
| Relative vapour density at 20 °C              | : No data available   |
| Relative density                              | : 1.208 Water : 77°F (25°C), 1 atm                                      |
| Relative density of saturated gas/air mixture | : No data available   |
| Density                                       | : 0.2697 lb/ft3 (4.320 kg/m3) vapour density                            |
| Relative gas density                          | : 3.6   |
| Solubility                                    | : Water: 1930 mg/l  |



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|   |                     |
|---|---------------------|
| Log Pow   | : 0.94              |
| Log Kow   | : Not applicable.   |
| Viscosity, kinematic                            | : Not applicable.   |
| Viscosity, dynamic                              | : Not applicable.   |
| Viscosity, kinematic (calculated value) (40 °C) | : No data available |
| Explosive properties                            | : Not applicable.   |
| Oxidizing properties                            | : None.             |
| Flammability (solid, gas)                       | :<br>Non flammable  |

### 9.2. Other information

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

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

|                                    |   |
|------------------------------------|---|
| Reactivity                         | : No reactivity hazard other than the effects described in sub-sections below.                    |
| Chemical stability                 | : Stable under normal conditions.   |
| Possibility of hazardous reactions | : None.   |
| Conditions to avoid                | : None under recommended storage and handling conditions (see section 7).                         |
| Incompatible materials             | : Aluminium. Carbon dioxide >1832°F (1000°C). Alloys with >2% magnesium in the presence of water. |
| Hazardous decomposition products   | : Thermal decomposition may produce : Fluorine. Carbonyl fluoride.                                |

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

|                             |                  |
|-----------------------------|------------------|
| Acute toxicity (oral)       | : Not classified |
| Acute toxicity (dermal)     | : Not classified |
| Acute toxicity (inhalation) | : Not classified |

| Halocarbon R134A ( f )811-97-2 |  |
|--------------------------------|--|
| LC50 inhalation rat (mg/l)     | 1500 g/m <sup>3</sup> (Exposure time: 4 h) |
| LC50 inhalation rat (ppm)      | 100000 ppm/1h                              |
| ATE CA (gases)                 | 50000.00000000 ppmv/4h                     |
| ATE CA (vapours)               | 1500.00000000 mg/l/4h                      |
| ATE CA (dust,mist)             | 1500.00000000 mg/l/4h                      |

|  |   |
|--|---|
| Skin corrosion/irritation                          | : Not classified<br>pH: Not applicable. |
| Serious eye damage/irritation                      | : Not classified<br>pH: Not applicable. |
| Respiratory or skin sensitization                  | : Not classified                        |
| Germ cell mutagenicity                             | : Not classified                        |
| Carcinogenicity                                    | : Not classified                        |
| Reproductive toxicity                              | : Not classified                        |
| Specific target organ toxicity (single exposure)   | : Not classified                        |
| Specific target organ toxicity (repeated exposure) | : Not classified                        |
| Aspiration hazard                                  | : Not classified                        |

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### SECTION 12: Ecological information

#### 12.1. Toxicity

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

#### 12.2. Persistence and degradability

##### Halocarbon R134A (811-97-2)

|                               |                            |
|-------------------------------|----------------------------|
| Persistence and degradability | Not readily biodegradable. |
|-------------------------------|----------------------------|

#### 12.3. Bioaccumulative potential

##### Halocarbon R134A (811-97-2)

|                           |   |
|---------------------------|---|
| Log Pow                   | 0.94  |
| Log Kow                   | Not applicable.   |
| Bioaccumulative potential | Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. |

#### 12.4. Mobility in soil

##### Halocarbon R134A (811-97-2)

|                  |   |
|------------------|---|
| Mobility in soil | No data available.  |
| Log Pow          | 0.94  |
| Log Kow          | Not applicable.   |
| Ecology - soil   | Because of its high volatility, the product is unlikely to cause ground or water pollution. |

#### 12.5. Other adverse effects

Effect on the ozone layer : None  
Global warming potential [CO<sub>2</sub>=1] : 1300  
Effect on global warming : When discharged in large quantities may contribute to the greenhouse effect  
Contains Fluorinated greenhouse gases covered by the Kyoto protocol

### SECTION 13: Disposal considerations

#### 13.1. Disposal methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

### SECTION 14: Transport information

#### 14.1. Basic shipping description

In accordance with TDG

##### TDG

UN-No. (TDG) : UN3159  
TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.  
Proper shipping name : 1,1,1,2-TETRAFLUOROETHANE

Explosive Limit and Limited Quantity Index : 0.125 L  
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 75 L

#### 14.3. Air and sea transport

##### IMDG

UN-No. (IMDG) : 3159  
Proper Shipping Name (IMDG) : 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)  
Class (IMDG) : 2 - Gases  
MFAG-No : 126

##### IATA

UN-No. (IATA) : 3159  
Proper Shipping Name (IATA) : 1,1,1,2-Tetrafluoroethane

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Class (IATA) : 2

### SECTION 15: Regulatory information

#### 15.1. National regulations

##### Halocarbon R134A (811-97-2)

Listed on the Canadian DSL (Domestic Substances List)

#### 15.2. International regulations

##### Halocarbon R134A (811-97-2)

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 EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Japanese ISHL (Industrial Safety and Health Law)  
Listed on the Korean ECL (Existing Chemicals List)  
Listed on NZIoC (New Zealand Inventory of Chemicals)  
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)  
Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Listed on INSQ (Mexican national Inventory of Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)

### SECTION 16: Other information

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#### Indication of changes:

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.

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

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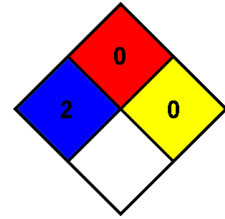
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- NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
- NFPA fire hazard : 0 - Materials that will not burn.
- NFPA reactivity : 0 - Normally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



### HMIS III Rating

- Health : 2 Moderate Hazard - Temporary or minor injury may occur
- Flammability : 0 Minimal Hazard - Materials that will not burn
- Physical : 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

### SDS Canada (GHS) - 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.*

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