SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form: Substance
Name: R-134a
Chemical name: 1,1,1,2-Tetrafluoroethane
EC-No.: 212-377-0
CAS-No.: 811-97-2
REACH registration No: 01-2119459374-33
Product code: 100013400
Synonyms: HFC 134a / NovaSpray HFC 134a / Novexpans HFC 134a

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

1.2.1. Relevant identified uses

Use of the substance/mixture: Refrigerant, Aerosol jet, Blowing agent

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier
- Dehon Service SAS
  26 Avenue du Petit Parc
  94683 VINCENNES Cedex - France
  T 01 43 98 75 00 - F 01 43 98 21 51
  ContactFDS@climalife.dehon.com

Supplier
- Galco s.a/n.v.
  Avenue Carton de Wiart, 79
  1090 BRUSSELS - Belgium
  T 00 32 2 421 01 84 - F 00 32 2 421 01 84 / 00 32 2 425 38 12
  ContactFDS@climalife.dehon.com

Supplier
- Climalife Kft Budepesta sucurcaia Bucuresti Romania
  Bulevardul Hristo Botev, Nr. 28,
  Biroul NR 4, Modulul I
  ContactFDS@climalife.dehon.com

Supplier
- Dehon Kälte-Fachvertriebs GmbH
  Robert-Bosch-Strasse 14
  40668 MEERBUSCH - Germany
  T 00 49 2150 7073 0 - F 00 49 2150 7073 17
  ContactFDS@climalife.dehon.com

Supplier
- Friogas sa
  Poligono Industrial SEPES
  Parcela 10
  46500 SAGUNTO (Valencia) - Spain
  T 00 34 9 6 266 36 32 - F 00 34 9 6 266 50 25
  ContactFDS@climalife.dehon.com

Supplier
- Prochimac SA
  Rue du Château 10
  CH-2000 NEUCHATEL - Switzerland
  T 00 41 32 727 36 00 - F 00 41 32 727 36 19
  ContactFDS@climalife.dehon.com
R-134a
Safety Data Sheet
according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Other
Climalife Asia Corporation
Room 302-A82, No. 3, Building 1509, Xin Zhen Road,
201101 Shanghai - China
T +86 21 6442 3972 - F +86 21 6442 3952
ContactFDS@climalife.dehon.com

1.4. Emergency telephone number
Emergency number : +33 (0) 1 72 11 00 03

SECTION 2: Hazards identification
2.1. Classification of the substance or mixture
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Press. Gas (Liq.) H280

Adverse physicochemical, human health and environmental effects
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Contact with the liquid may cause frostbite and serious damage to eyes. Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.

2.2. Label elements

Hazard pictograms (CLP):
GHS04

Signal word (CLP): Warning
Hazard statements (CLP): H280 - Contains gas under pressure; may explode if heated.
Precautionary statements (CLP): P410+P403 - Protect from sunlight. Store in a well-ventilated place.
Extra phrases: Greenhouse fluorinated gas falling within Kyoto Protocol (GWP=1430).

2.3. Other hazards
No additional information available

SECTION 3: Composition/information on ingredients
3.1. Substances

Name : R-134a
CAS-No. : 811-97-2
EC-No. : 212-377-0

Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
--- | --- | --- | --- |
1,1,1,2-Tetrafluoroethane | (CAS-No.) 811-97-2 (EC-No.) 212-377-0 (REACH-no) 01-2119459374-33 | 100 | Press. Gas (Liq.), H280 |

3.2. Mixtures
Not applicable

SECTION 4: First aid measures
4.1. Description of first aid measures
First-aid measures after inhalation: Move the affected person away from the contaminated area and into the fresh air. If you feel unwell, seek medical advice.
First-aid measures after skin contact: In the event of contact with the liquid: treat resulting frostbite as a burn. Immediately remove contaminated clothing or footwear. Immediately rinse with plenty of water. If skin burns appear, call a doctor immediately.
First-aid measures after eye contact: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Consult an eye specialist immediately.

First-aid measures after ingestion: Not specifically applicable (gas).

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

**Symptoms/effects:** CNS depression. Narcosis. Cardiac disorders. Lack of oxygen: risk of death.

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

No additional information available

---

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

**Suitable extinguishing media:** All extinguishing agents can be used.

**Unsuitable extinguishing media:** None to our knowledge. If there is a fire close by, use suitable extinguishing agents.

#### 5.2. Special hazards arising from the substance or mixture

**Explosion hazard:** Pressure increase. Under certain temperature and pressure conditions may form a flammable mixture in the presence of air. On heating: Toxic and corrosive vapours are released.

#### 5.3. Advice for firefighters

**Firefighting instructions:** Use water spray or fog for cooling exposed containers.

**Protection during firefighting:** Self-contained breathing apparatus. Complete protective clothing.

---

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

**General measures:** Avoid contact with skin and eyes. Remove all sources of ignition. Do not smoke. Evacuate the danger area. Do not breathe smoke. Stop the leak.

**For non-emergency personnel**

No additional information available

**For emergency responders**

No additional information available

#### 6.2. Environmental precautions

No additional information available

#### 6.3. Methods and material for containment and cleaning up

**Other information:** Mechanically ventilate the spillage area.

**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:** Ventilation.

**Hygiene measures:** Do not drink, eat or smoke in the workplace.

#### 7.2. Conditions for safe storage, including any incompatibilities

**Storage conditions:** Store : in a cool, well-ventilated area. away from any source of ignition. away from any source of heat.

**Incompatible materials:** Strong oxidizing agents. Alkaline hydroxide. Alkaline earth metals. Finely divided metals (Al, Mg, Zn).


#### 7.3. Specific end use(s)

No additional information available

---

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

**R-134a (811-97-2)**

Sweden - Occupational Exposure Limits

**Anmärkning (SE):** V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)

**1,1,1,2-Tetrafluoroethane (811-97-2)**

Germany - Occupational Exposure Limits (TRGS 900)

**TRGS 900 Local name:** Norfluran

**Occupational exposure limit value (mg/m³):** 4200 mg/m³

---

6/4/2020 (Version: 18.1) EN (English)
### Occupational Exposure Limit Value (ppm)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitation of exposure peaks (mg/m³)</td>
<td>33600</td>
</tr>
<tr>
<td>Limitation of exposure peaks (ppm)</td>
<td>8000</td>
</tr>
<tr>
<td>Limitation of exposure peaks</td>
<td>8(II)</td>
</tr>
</tbody>
</table>

### TRGS 900 Remark

- DFG:Y

### TRGS 900 Regulatory Reference

- TRGS900

### Sweden - Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Local name</th>
<th>HFC 134a (1,1,1,2-Tetrafluoroethane)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>nivågränsvärde (NVG) (mg/m³)</strong></td>
<td>2000 mg/m³</td>
</tr>
<tr>
<td><strong>nivågränsvärde (NVG) (ppm)</strong></td>
<td>500 ppm</td>
</tr>
<tr>
<td><strong>kortidsvärde (KTV) (mg/m³)</strong></td>
<td>3000 mg/m³</td>
</tr>
<tr>
<td><strong>kortidsvärde (KTV) (ppm)</strong></td>
<td>750 ppm</td>
</tr>
</tbody>
</table>

| Anmärkning (SE)                   | V (Vägledande kortidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas) |

| Regulatory reference             | Hygieniska gränsvärden (AFS 2015:7) |

### United Kingdom - Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Local name</th>
<th>1,1,1,2-Tetrafluoroethane (HFC 134a)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEL TWA (mg/m³)</strong></td>
<td>4240 mg/m³</td>
</tr>
<tr>
<td><strong>WEL TWA (ppm)</strong></td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

| Regulatory reference             | EH40. HSE                           |

### Switzerland - Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Local name</th>
<th>1,1,1,2-Tetrafluoroethane (811-97-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAK (mg/m³)</strong></td>
<td>4200 mg/m³</td>
</tr>
<tr>
<td><strong>MAK (ppm)</strong></td>
<td>1000 ppm</td>
</tr>
</tbody>
</table>

### 1,1,1,2-Tetrafluoroethane (811-97-2)

#### DNEL/DMEL (Workers)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term - systemic effects, inhalation</td>
<td>13936 mg/m³</td>
</tr>
</tbody>
</table>

#### DNEL/DMEL (General population)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term - systemic effects, inhalation</td>
<td>2476 mg/m³</td>
</tr>
</tbody>
</table>

#### PNEC (Water)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC aqua (freshwater)</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>PNEC aqua (marine water)</td>
<td>0.01 mg/l</td>
</tr>
</tbody>
</table>

#### PNEC (Sediment)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC sediment (freshwater)</td>
<td>0.75 mg/kg dwt</td>
</tr>
</tbody>
</table>

#### PNEC (STP)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC sewage treatment plant</td>
<td>73 mg/l</td>
</tr>
</tbody>
</table>

### 8.2. Exposure Controls

#### Hand Protection:

- Leather protective gloves. Nitrile-rubber protective gloves. VITON gloves

#### Eye Protection:

- Safety glasses with side shields

#### Skin and Body Protection:

- Majority cotton protective clothing

#### Respiratory Protection:

- In the event of insufficient ventilation: Gas mask with filter type AX. In a confined area: Self-contained breathing apparatus
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>Appearance</td>
<td>Press. Gas (Liq.)</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>slightly ethereal.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Relative evaporation rate (butylacetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-101 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>-26.2 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>None</td>
</tr>
<tr>
<td>Critical temperature</td>
<td>101 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>&gt; 750 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 370 °C</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Non flammable</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>5.7 bar</td>
</tr>
<tr>
<td>Vapour pressure at 50 °C</td>
<td>13.2 bar</td>
</tr>
<tr>
<td>Critical pressure</td>
<td>4070 kPa</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>3.5</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Density</td>
<td>1.2 g/cm³ (20°C)</td>
</tr>
<tr>
<td>Solubility</td>
<td>Water: 1.5 g/l</td>
</tr>
<tr>
<td>Log Pow</td>
<td>1.06</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive material according to EC criteria.</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Non oxidizing material according to EC criteria.</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No information available.

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

No information available.

10.4. Conditions to avoid

Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.

10.5. Incompatible materials

Alkalis and caustic products. Alkaline earth metals. Strong oxidizing agents. Finely divided metals (Al, Mg, Zn).

10.6. Hazardous decomposition products

On thermal decomposition (pyrolysis), releases: Carbon oxides (CO, CO2). Hydrogen 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

1,1,1,2-Tetrafluoroethane (811-97-2)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>&gt; 500000 ppm/4h</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>pH:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional information: Contact with the liquid causes frostbite
**R-134a**

**Safety Data Sheet**

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

---

**Serious eye damage/irritation**: Not classified

**Additional information**: Contact with the liquefied gas may cause severe ocular lesions

**Respiratory or skin sensitisation**: Not classified

**Germ cell mutagenicity**: Not classified

**Carcinogenicity**: Not classified

**1,1,1,2-Tetrafluoroethane (811-97-2)**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAEL (chronic, oral, animal/male, 2 years)</td>
<td>300 mg/kg bodyweight rat</td>
</tr>
</tbody>
</table>

**Reproductive toxicity**: Not classified

**STOT-single exposure**: Not classified

**STOT-repeated exposure**: Not classified

**Aspiration hazard**: Not classified

---

**SECTION 12: Ecological information**

**12.1. Toxicity**

Hazardous to the aquatic environment, short-term (acute): Not classified

Hazardous to the aquatic environment, long-term (chronic): Not classified

**1,1,1,2-Tetrafluoroethane (811-97-2)**

| LC50 fish 1 | 450 mg/l 96 Hours (Oncorhynchus mykiss) |
| EC50 Daphnia 1 | 980 mg/l 48 Hours (Daphnia magna) |
| EC50 72h algae (1) | > 118 mg/l (Selenastrum capricornutum) |

**12.2. Persistence and degradability**

**1,1,1,2-Tetrafluoroethane (811-97-2)**

Persistence and degradability: Photodegradation in the air: Half-life in air: 9.7 y. 3 % biodegradation after 28 days.

**12.3. Bioaccumulative potential**

**R-134a (811-97-2)**

| Log Pow | 1.06 |

**1,1,1,2-Tetrafluoroethane (811-97-2)**

| Log Pow | 1.06 |

**12.4. Mobility in soil**

**1,1,1,2-Tetrafluoroethane (811-97-2)**

| Log Koc | 1.5 |

**12.5. Results of PBT and vPvB assessment**

**Component**

1,1,1,2-Tetrafluoroethane (811-97-2): This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

**12.6. Other adverse effects**

Other adverse effects: Ozone depletion factor ODP (R-11=1) = 0. Total global warming potential (GWP): 1430.

---

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**


**Product/Packaging disposal recommendations**: Methods of disposal of packaging. Reuse or recycle following decontamination. Destroy at an authorised site.

**Additional information**: The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal.

---

**SECTION 14: Transport information**

In accordance with ADR / IATA / IMDG
### ADR | IMDG | IATA
--- | --- | ---
### 14.1. UN number
UN 3159 & UN 3159 & UN 3159

### 14.2. UN proper shipping name
1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A) & 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) & 1,1,1,2-Tetrafluoroethane

### Transport document description
UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), 2.2, (C/E) & UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a), 2.2 & UN 3159 1,1,1,2-Tetrafluoroethane, 2.2

### 14.3. Transport hazard class(es)
2.2 & 2.2 & 2.2

![Hazard class 2.2](image)

### 14.4. Packing group
Not applicable & Not applicable & Not applicable

### 14.5. Environmental hazards
Dangerous for the environment : No & Dangerous for the environment : No & Dangerous for the environment : No

Marine pollutant : No & Marine pollutant : No & Marine pollutant : No

No supplementary information available

### 14.6. Special precautions for user

#### Overland transport
Classification code (ADR) : 2A
Special provisions (ADR) : 662
Limited quantities (ADR) : 120ml
Tank code (ADR) : PxBN(M)
Transport category (ADR) : 3
Hazard identification number (Kemler No.) : 20
Orange plates

![Orange plate](image)

Tunnel restriction code (ADR) : C/E
EAC code : 2TE

#### Transport by sea
Limited quantities (IMDG) : 120 ml
EmS-No. (Fire) : F-C
EmS-No. (Spillage) : S-V

#### Air transport
PCA Limited quantities (IATA) : Forbidden
PCA limited quantity max net quantity (IATA) : Forbidden
PCA packing instructions (IATA) : 200
PCA max net quantity (IATA) : 75kg
CAO packing instructions (IATA) : 200
CAO max net quantity (IATA) : 150kg

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable
**SECTION 15: Regulatory information**

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

R-134a is not on the REACH Candidate List

R-134a is not on the REACH Annex XIV List


Other information, restriction and prohibition regulations:


15.1.2. National regulations

Ensure all national/local regulations are observed.

**Germany**

Reference to AwSV: Water hazard class (WGK) 1, Slightly hazardous to water (Classification according to AwSV; ID No. 2350)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV: Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

**Netherlands**

SZW-lijst van kankerverwekkende stoffen: The substance is not listed

SZW-lijst van mutagene stoffen: The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding: The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid: The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling: The substance is not listed

**Switzerland**

Swiss National Regulations: ORRChim RS 814.81.

15.2. Chemical safety assessment

No additional information available

**SECTION 16: Other information**

Indication of changes:

<table>
<thead>
<tr>
<th>Section</th>
<th>Changed item</th>
<th>Change</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>Supplier</td>
<td>Added</td>
<td></td>
</tr>
</tbody>
</table>

Other information:

For more information regarding the use of this product, please refer to our technical information or contact the sales department in your region.

**Full text of H- and EUH-statements:**

**Press. Gas (Liq.)**

Gases under pressure: Liquefied gas

H280

Contains gas under pressure; may explode if heated.

SDS EU (REACH Annex II)

*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.*