

## GPS Safety Summary

**Substance Name:**

### **1-chloro-1,1-difluoroethane**

#### **1. General Statement**

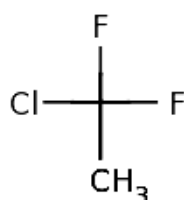
---

1-chloro-1,1-difluoroethane (Forane® 142b) is an industrial gas which is used as a chemical intermediate in strictly controlled conditions for the synthesis of Vinylidene fluoride (VF2) and 1,1,1-Trifluoroethane (Forane® 143a).

#### **2. Chemical Identity**

---

|                               |  |
|-------------------------------|--|
| <b>Names:</b>                 | HCFC-142b; R-142b; 1-chloro-1,1-difluoroethane |
| <b>Brand name:</b>            | Forane® 142b                                   |
| <b>Chemical name (IUPAC):</b> | 1-chloro-1,1-difluoroethane                    |
| <b>CAS number:</b>            | 75-68-3  |
| <b>EC number:</b>             | 200-891-8                                      |
| <b>Molecular formula:</b>     | C <sub>2</sub> H <sub>3</sub> ClF <sub>2</sub> |
| <b>Structure:</b>             |  |



#### **3. Use and applications**

---

1-chloro-1,1-difluoroethane (Forane® 142b) is industrially manufactured and used as a chemical intermediate under strictly controlled conditions for the synthesis of 1,1,1-Trifluoroethane (Forane® 143a) and Vinylidene fluoride (VF2). These substances are used in refrigeration industry and to produce fluoropolymers, respectively.

1-chloro-1,1-difluoroethane is not sold to consumers.

#### **4. Physical / Chemical properties**

---

1-chloro-1,1-difluoroethane is an extremely flammable gas with the following physicochemical properties:

| Property       | Value                          |
|----------------|--------------------------------|
| Physical state | Gas at 20°C and 1013 hPa       |
| Form           | Liquefied gas (under pressure) |
| Colour         | Colourless                     |
| Odour          | Slightly ether-like            |

|  |  |
|--|--|
| Molecular weight   | 100.5 g/mol  |
| Vapour pressure  | 0.34 MPa at 20°C   |
| Freezing / boiling points                                  | -130.8°C / -9.2°C  |
| Flash point  | Not applicable   |
| Flammability   | Lower/Upper flammability limits: 5.5/17.5 % (v/v)<br>Extremely flammable gas |
| Self-ignition temperature                                  | 625°C  |
| Explosive / oxidizing properties                           | Not expected based on structure  |
| Water solubility   | 1.4 g/L at 20°C  |
| Octanol-water partition coefficient (Log K <sub>ow</sub> ) | 1.62 - 2.05 (calculated)   |

## 5. Health Effects

1-chloro-1,1-difluoroethane is rapidly absorbed by lungs. Very little metabolism occurs and it is rapidly eliminated. 1-chloro-1,1-difluoroethane is practically non-toxic.

| Effect Assessment  | Result   |
|--|--|
| Acute Toxicity<br>Oral / inhalation / dermal                   | Very low inhalation toxicity in animals. At extremely high vapour concentrations, it shows some anaesthetic-like effects and can act as an asphyxiant.<br>Dermal and oral: not relevant for a gas. |
| Irritation / corrosion<br>Skin / eye / respiratory tract       | The gas is not irritating to the skin, eyes or respiratory tract. Frostbite can result from contact with liquefied gas.  |
| Sensitisation  | At extremely high vapour concentrations, it may cause effects on heart function (cardiac arrhythmia).<br>Inhalation: no data. Dermal: not relevant for a gas.                                      |
| Toxicity after repeated exposure<br>Oral / inhalation / dermal | Studies of prolonged inhalation in animals showed no specific chronic toxic effects.<br>Dermal and oral: not relevant for a gas.   |
| Genotoxicity / Mutagenicity                                    | Not expected to cause genetic effects based on available test data, <i>in vitro</i> and in animals.  |
| Carcinogenicity  | No carcinogenic effects were noted in rats after inhalation exposure for up to two years.  |
| Reproductive / Developmental Toxicity                          | No effects on fetal development were noted in rats.  |

## 6. Environmental Effects

1-chloro-1,1-difluoroethane is of low toxicity to fish and aquatic invertebrates. No experimental data are available for algae, but based on data on a related fluorocarbon, its toxicity to algae is also low.

As it is a gas, any emitted 1-chloro-1,1-difluoroethane will quickly partition to the atmosphere, where it takes decades to photolyse. It will not partition significantly to soil or sediment due to its volatility and expected moderate adsorption. It is not expected to bioaccumulate in the food chain based on its volatility and low lipophilicity (calculated log K<sub>ow</sub> = 1.62 - 2.05).

1-chloro-1,1-difluoroethane is an ozone-depleting substance.



## 8. Risk Management recommendations

In accordance with the REACH Regulation, no risk assessment is required as 1-chloro-1,1-difluoroethane is an intermediate in strictly controlled conditions.

| Human health measures   |   |
|---|---|
| <b>Organizational</b>   | Only use for the purpose of chemical transformation (intermediate)*.<br>Implement high standards of occupational hygiene*.<br>Ensure operatives are well informed of the hazards and trained to minimise exposures*.<br>Maintain clear and up-to-date handling procedures and control their application*.<br>Collect the latest available Safety Data Sheet.<br>Handle and store according to the indications of the Safety Data Sheet.   |
| <b>Engineering controls</b>   | Manufacture and use in rigorously contained (closed) systems*.<br>Use material of high integrity for loading and unloading*.<br>Reduce exposures to a minimum and ensure their regular monitoring*.<br>Provide sufficient ventilation and/or local exhaust ventilation in work areas*.<br>Purge and ventilate systems before cleaning/maintenance worker entry*.<br>Handle only in well ventilated areas.<br>Prevent inflammation and explosion of the pressured container. Notably, do not expose the container to sunlight, heat or sources of ignition.<br>Ensure that eye- and handwash stations and safety showers are close to workstation locations. |
| <b>Protection</b>   | <b>Eye/Face protection:</b> Safety glasses with side-shields  |
|   | <b>Skin protection:</b> Protective suit (cotton)  |
|   | <b>Hand protection:</b> Leather gloves  |
|   | <b>Respiratory protection:</b> Respirator if ventilation is insufficient or when opening systems.*  |
| Environment protective measures   |   |
| Do not release into the environment.<br>Collect and recycle the used product: contact the manufacturer for further information. |   |

\*: Taken together, these specific risk management measures enable to respect strictly controlled conditions of manufacture and use along the whole life-cycle.

## 9. Regulatory Information / Classification and Labelling




### 9.1 Regulatory Information

This substance has notably been registered and/or assessed under:

- EU Regulation EC 1907/2006 (REACH)
- US EPA IRIS (Integrated Risk Information System)
- OECD SIDS (Screening Information Data Set) program

## 9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

| Classification   |  |
|--|--|
| <ul style="list-style-type: none"><li>– Flammable gases: Category 1.</li><li>– Gases under pressure: Category Liquefied Gas.</li><li>– Chronic aquatic toxicity, Category 3, H412</li><li>– Hazardous to the ozone layer, Category 1, H420</li></ul>   |  |
| Signal word  |  |
| – Danger   |  |
| Pictograms   |  |
| – GHS02: Flame   |                                        |
| – GHS04: Gas cylinder  | <br>(facultative due to above symbol) |
| – GHS07: Exclamation mark  |                                      |
| Hazard statements  |  |
| <ul style="list-style-type: none"><li>– H220: Extremely flammable gas.</li><li>– H280: Contains gas under pressure; may explode if heated.</li><li>– H412: Harmful to aquatic life with long lasting effects.</li><li>– H420: Harms public health and the environment by destroying ozone in the upper atmosphere.</li></ul> |  |
| Additional classification according to Globally Harmonized System (GHS)  |  |
| – Acute aquatic toxicity: Category 3; Harmful to aquatic life  |  |

## 10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- **ICCA portal where the GPS Safety Summary is posted:**  
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

## 11. Date of Issues / Revision

---

- Date of issue: 2013/04/15
- Date of revision:

## 12. Disclaimer

---

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN.

No liability will be accepted by ARKEMA for damages of any nature whatsoever resulting from the use of or reliance on the information.