

## Chemical Safety Data Sheet MSDS / SDS

**1-Chloro-1,1-difluoroethane**

Revision Date:2024-03-16 Revision Number:1

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

Product name : 1-Chloro-1,1-difluoroethane  
CBnumber : CB8162234  
CAS : 75-68-3  
EINECS Number : 200-891-8  
Synonyms : r142b,HCFC-142B

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

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.  
Uses advised against : none

**Company Identification**

Company : Chemicalbook  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

**SECTION 2: Hazards identification****Classification of the substance or mixture**

Flammable gases, Category 1A, Flammable gas  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3  
Hazardous to the ozone layer, Category 1

**Label elements****Pictogram(s)**

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Signal word : Danger

**Hazard statement(s)**

H220 Extremely flammable gas  
H280 Contains gas under pressure; may explode if heated  
H420 Harms public health and the environment by destroying ozone in the upper atmosphere

**Precautionary statement(s)**

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.  
P410+P403 Protect from sunlight. Store in a well-ventilated place.

### Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273 Avoid release to the environment.

### Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

### Storage

P403 Store in a well-ventilated place.

### Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

P502 Refer to manufacturer or supplier for information on recovery or recycling

### Other hazards

no data available

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## SECTION 3: Composition/information on ingredients

### Substance

Product name	: 1-Chloro-1,1-difluoroethane
Synonyms	: r142b,HCFC-142B
CAS	: 75-68-3
EC number	: 200-891-8
MF	: C2H3ClF2
MW	: 100.5

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## SECTION 4: First aid measures

### Description of first aid measures

#### If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

#### Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

#### Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

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

Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]: Vapors may cause dizziness or asphyxiation without warning. Some may be irritating if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or

frostbite. Fire may produce irritating and/or toxic gases. (ERG, 2016)

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

In persons who are intoxicated with fluorocarbons, steps can be taken to lessen the risk of arrhythmias. ... Before evaluation at the hospital, patients should be advised to avoid strenuous exercise. In the hospital, patients can be placed in a quiet, nonthreatening environment and sedated if necessary. If hypoxic, oxygen should be administered and metabolic abnormalities corrected. Sympathomimetic drugs should be avoided. Ventricular arrhythmias are best treated with beta-blocking agents. Fluorocarbons

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## SECTION 5: Firefighting measures

### Extinguishing media

This chemical is a flammable gas. Poisonous gases including phosgene, hydrogen fluoride, hydrogen chloride, and chlorine are produced in fire. Use dry chemical, carbon dioxide, or foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors may travel long distances to ignition sources and flashback. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position ...

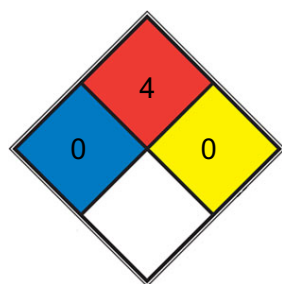
### Specific Hazards Arising from the Chemical

Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]: EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. (ERG, 2016)

### Advice for firefighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with water spray. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

### NFPA 704



■ HEALTH 0 Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials

■ FIRE 4 Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Includes pyrophoric substances. Flash point below room temperature at 22.8 °C (73 °F). (e.g. acetylene,

propane, [hydrogen gas](#))

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REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N<sub>2</sub>](#))

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HAZ.

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## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: chemical protection suit including self-contained breathing apparatus.

### Environmental precautions

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: chemical protection suit including self-contained breathing apparatus.

### Methods and materials for containment and cleaning up

Evacuate and restrict persons not wearing protective equipment from area for leak until clean-up is complete. Remove all ignition sources. Establish forced ventilation to keep levels below explosive limit. Stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air and repair leak or allow cylinder to empty. Keep chlorodifluoroethane out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the build-up of explosive concentrations. It may be necessary to contain and dispose of this chemical as a hazardous waste. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters ...

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## SECTION 7: Handling and storage

### Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Fireproof. Cool. Chlorodifluoroethane must be stored to avoid contact with oxidizers (such as perchlorates, peroxides, permanganates, chlorates, and nitrates) since violent reactions occur. Detached or outside storage is preferred. Metal containers involving the transfer of this chemical should be grounded and bonded. Where possible, automatically pump liquid from drums or other storage containers to process containers. Drums must be equipped with self-closing valves, pressure vacuum bungs, and flame arresters. Use only non-sparking tools and equipment, especially when opening and closing containers of this chemical. Sources of ignition, such as smoking and open flames, are prohibited where this chemical is used, handled, or stored in a manner that could create a potential fire or explosion hazard ...

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## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

MAK: 4200 mg/m<sup>3</sup>, 1000 ppm; peak limitation category: II(8); pregnancy risk group: D

### Biological limit values

no data available

### Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures

#### Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

#### Skin protection

Cold-insulating gloves.

#### Respiratory protection

Use ventilation.

#### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

Physical state	Gaseous. Gas.
Colour	Colourless.
Odour	Nearly odorless
Melting point/freezing point	-130.8 °C. Atm. press.:101.325 kPa. Remarks:In absence of indication in the Handbook, the pressure is assumed to be the normal atmospheric pressure.
Boiling point or initial boiling point and boiling range	-9.2 °C. Atm. press.:1 030 hPa.
Flammability	Extremely flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	18%
Flash point	Flammable gas
Auto-ignition temperature	625 °C. Atm. press.:998 mBar.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	Gas = 0.01099 cP at 25 deg C; Liquid = 0.453 cP at -20.9 deg C
Solubility	Insoluble in water; sol in benzene
Partition coefficient n-octanol/water	log Pow = 2.05. Temperature:20 °C.
Vapour pressure	2196 mm Hg ( 21 °C)
Density and/or relative density	1.108
Relative vapour density	3.49 (vs air)

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Particle characteristics	no data available
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## SECTION 10: Stability and reactivity

### Reactivity

Decomposes on burning. This produces toxic and corrosive gases including hydrogen chloride and hydrogen fluoride. Reacts violently with oxidants. This generates fire hazard.

### Chemical stability

no data available

### Possibility of hazardous reactions

Flammable gas. The gas is heavier than air and may travel along the ground; distant ignition possible. The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. 1-CHLORO-1,1-DIFLUOROETHANE is chemically inert in many situations, but can react violently with strong reducing agents such as the very active metals and the active metals. Can react with strong oxidizing agents or weaker oxidizing agents under extremes of temperature.

### Conditions to avoid

no data available

### Incompatible materials

Can react vigorously with oxidizing materials.

### Hazardous decomposition products

When heated to decomposition, emits toxic fumes of ... /hydrogen fluoride and hydrogen chloride/.

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: no data available
- Inhalation: LC50 - rat (male/female) - > 400 000 ppm.
- Dermal: no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### **Carcinogenicity**

no data available

### **Reproductive toxicity**

no data available

### **STOT-single exposure**

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the cardiovascular system.

### **STOT-repeated exposure**

no data available

### **Aspiration hazard**

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

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## SECTION 12: Ecological information

### **Toxicity**

Toxicity to fish: LC50 - *Poecilia reticulata* - 220 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 160 mg/L - 48 h.

Toxicity to algae: EC50 growth rate - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 96.6 mg/L - 96 h.

Toxicity to microorganisms: various bacteria.

### **Persistence and degradability**

1-Chloro-1,1-difluoroethane did not biodegrade using sewage sludge(1), *Methylosinus trichosporium*, *M. vaccae* JOB5, ENV2040 nor ENV2041 strains of organisms(2).

### **Bioaccumulative potential**

An estimated BCF of 10 was calculated in fish for 1-chloro-1,1-difluoroethane(SRC), using an estimated log Kow of 2.05(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### **Mobility in soil**

Using a structure estimation method based on molecular connectivity indices(1), the Koc of 1-chloro-1,1-difluoroethane can be estimated to be 40(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1-chloro-1,1-difluoroethane is expected to have very high mobility in soil.

### **Other adverse effects**

no data available

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## SECTION 13: Disposal considerations

## Disposal methods

### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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## SECTION 14: Transport information

### UN Number

ADR/RID: UN2517 (For reference only, please check.)

IMDG: UN2517 (For reference only, please check.)

IATA: UN2517 (For reference only, please check.)

### UN Proper Shipping Name

ADR/RID: 1-CHLORO-1,1- DIFLUOROETHANE (REFRIGERANT GAS R 142b) (For reference only, please check.)

IMDG: 1-CHLORO-1,1- DIFLUOROETHANE (REFRIGERANT GAS R 142b) (For reference only, please check.)

IATA: 1-CHLORO-1,1- DIFLUOROETHANE (REFRIGERANT GAS R 142b) (For reference only, please check.)

### Transport hazard class(es)

ADR/RID: 2.1 (For reference only, please check.)

IMDG: 2.1 (For reference only, please check.)

IATA: 2.1 (For reference only, please check.)

### Packing group, if applicable

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

### Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

### Special precautions for user

no data available

### Transport in bulk according to IMO instruments

no data available



## SECTION 15: Regulatory information

### Safety, health and environmental regulations specific for the product in question

#### European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

#### EC Inventory

Listed.

#### United States Toxic Substances Control Act (TSCA) Inventory

Listed.

#### China Catalog of Hazardous chemicals 2015

Listed.

#### New Zealand Inventory of Chemicals (NZIoC)

Listed.

#### PICCS

Listed.

#### Vietnam National Chemical Inventory

Listed.

#### IECSC

Listed.

#### Korea Existing Chemicals List (KECL)

Listed.

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## SECTION 16: Other information

### Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

### **Other Information**

High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering area. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

#### **Disclaimer:**

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.