

## Safety data sheet Chlorodifluoromethane (R 22)

Creation date : 28.01.2005  
Revision date : 09.05.2011

Version : 1.3

GB / E

SDS No. : 027  
page 1 / 5

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

#### 1.1. Product identifier

##### Product name

Chlorodifluoromethane (R 22)

EC No (from EINECS): 200-871-9

CAS No: 75-45-6

Index-Nr.

**Chemical formula** CHClF<sub>2</sub>

**REACH Registration number:**

Not available.

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

##### Relevant identified uses

Industrial and professional. Perform risk assessment prior to use., Refrigerant.

##### Uses advised against

Consumer use.

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

##### Company identification

BOC, Priestley Road, Worsley, Manchester M28 2UT

**E-Mail Address** ReachSDS@boc.com

#### 1.4. Emergency telephone number

**Emergency phone numbers (24h):** 0800 111 333

### SECTION 2: Hazards identification

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

##### Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)

Press. Gas (Liquefied gas) - Contains gas under pressure; may explode if heated.

Ozone - Hazardous to the ozone layer.

##### Classification acc. to Directive 67/548/EEC & 1999/45/EC

N; R59

Asphyxiant in high concentrations.

Dangerous for the ozone layer.

##### Risk advice to man and the environment

Liquefied gas.

Contact with liquid may cause cold burns/frost bite.

#### 2.2. Label elements

##### - Labelling Pictograms



##### - Signal word

Danger

##### - Hazard Statements

H280

Contains gas under pressure; may explode if heated.

EUH059

Hazardous to the ozone layer.

EIGA-As

Asphyxiant in high concentrations.

##### - Precautionary Statements

##### Precautionary Statement Prevention

P273

Avoid release to the environment.

##### Precautionary Statement Response

None.

##### Precautionary Statement Storage

P403

Store in a well-ventilated place.

##### Precautionary Statement Disposal

None.

#### 2.3. Other hazards

Contact with liquid may cause cold burns/frost bite.

### SECTION 3: Composition/information on ingredients

**Substance / Mixture:** Substance.

#### 3.1. Substances

Chlorodifluoromethane (R 22)

**CAS No:** 75-45-6

**Index-Nr.:**

**EC No (from EINECS):** 200-871-9

**REACH Registration number:**

Not available.

Contains no other components or impurities which will influence the classification of the product.

#### 3.2. Mixtures

Not applicable.

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

##### First Aid General Information:

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 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 Skin / Eye:

In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes.

##### First Aid Ingestion:

Ingestion is not considered a potential route of exposure.

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

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

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

None.

### SECTION 5: Fire fighting measures

#### 5.1. Extinguishing media

##### Suitable extinguishing media

All known extinguishants can be used.

## Safety data sheet

### Chlorodifluoromethane (R 22)

Creation date : 28.01.2005  
Revision date : 09.05.2011

Version : 1.3

GB / E

SDS No. : 027  
page 2 / 5

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

##### Specific hazards

Exposure to fire may cause containers to rupture/explode.

##### Hazardous combustion products

If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:

Carbon monoxide, Phosgene, Hydrogen chloride, Hydrogen fluoride, Carbonyl fluoride.

#### 5.3. Advice for fire-fighters

##### Specific methods

If possible, stop flow of product. Move container away or cool with water from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

##### Special protective equipment for fire-fighters

Use self-contained breathing apparatus. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to EN 469 will provide a basic level of protection from chemical incidents. EN 469:2005: Protective clothing for fire-fighters. Performance requirements for protective clothing for fire-fighting.

### SECTION 6: Accidental release measures

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

Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

#### 6.2. Environmental precautions

Try to stop release.

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

Ventilate area.

#### 6.4. Reference to other sections

See also sections 8 and 13.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle gases under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Do not smoke while handling product. Ensure the complete gas system has been (or is regularly) checked for leaks before use. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Refer to supplier's handling instructions. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected

from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

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

Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. Containers should be stored in the vertical position and properly secured to prevent falling over. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

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

None.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

##### Exposure limit value

Value type	value	Note
ILV	1.000 ppm	(EU) 8 h OEL
Great Britain - LTEL	1.000 ppm	EH 40/07
PNEC not available.		
DNEL not available		

#### 8.2. Exposure controls

##### Appropriate engineering controls

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Product to be handled in a closed system. Keep concentrations well below occupational exposure limits. Oxygen detectors should be used when asphyxiating gases may be released. The substance must be handled in accordance with good industrial hygiene and safety procedures. Consider work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Provide adequate general or local ventilation.

##### Personal protective equipment

###### Eye and face protection

Wear a face-shield when transfilling and breaking transfer connections. Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases.

###### Skin protection

###### Hand protection

Advice: Wear cold insulating gloves.

Guideline: EN 511 Protective gloves against cold.

###### Body protection

Protect eyes, face and skin from contact with product.

###### Other protection

Wear working gloves and safety shoes while handling gas cylinders. ISO 20345 Safety footwear

###### Thermal hazards

If there is a risk of contact with the liquid, all protective equipment should be suitable for extremely low temperatures.

###### Environmental Exposure Controls

# Safety data sheet

## Chlorodifluoromethane (R 22)

Creation date : 28.01.2005  
Revision date : 09.05.2011

Version : 1.3

GB / E

SDS No. : 027  
page 3 / 5

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

### SECTION 9: Physical and chemical properties

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

##### General information

**Appearance/Colour:** Colourless gas.

**Odour:** Ethereal Poor warning properties at low concentrations.

##### Odour threshold:

Odour threshold is subjective and inadequate to warn for over exposure.

**Melting point:** -157 °C

**Boiling point:** -40,9 °C

**Flash point:** Not applicable for gases and gas mixtures.

##### Evaporation rate:

Not applicable for gases and gas mixtures.

**Flammability range:** Non flammable.

**Vapour Pressure 20 °C:** 9,1 bar

**Relative density, gas:** 3

**Solubility in water:** 3628 mg/l

**Partition coefficient: n-octanol/water:** 1,08 logPow

**Autoignition temperature:** Not applicable.

##### Explosive properties:

Explosive acc. EU legislation: Not explosive.

Explosive acc. transp. reg.: Not explosive.

**Molecular weight:** 86,5 g/mol

**Critical temperature:** 96,2 °C

**Relative density, liquid:** 1,2

#### 9.2. Other 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

Unreactive under normal conditions.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

None.

#### 10.4. Conditions to avoid

Heat.

#### 10.5. Incompatible materials

Moisture. May react violently with alkaline-earth and alkali metals. For material compatibility see latest version of ISO-11114.

#### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. The following decomposition products may be produced:

Carbon monoxide, Phosgene, Hydrogen chloride, Hydrogen fluoride, Carbonyl fluoride.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

##### General

May produce irregular heart beat and nervous symptoms.

#### Acute inhalation toxicity

Value: LC50

Species: Rat

Exposure time: 4 h

Value in standard unit mg/l: 778 mg/l

Value: LC50

Species: Rat

Exposure time: 0,25 h

Value in standard unit mg/l: 1.237 mg/l

Value: LC50

Species: Mouse

Exposure time: 0,5 h

Value in standard unit mg/l: 990 mg/l

#### Acute dermal toxicity

No known effects from this product.

#### Acute toxicity other routes

No known effects from this product.

#### Skin irritation

No known effects from this product.

#### Eye irritation

No known effects from this product.

#### Sensitization

No known effects from this product.

#### Repeated dose toxicity

No known effects from this product.

#### Assessment mutagenicity

No known effects from this product.

#### Assessment carcinogenicity

No known effects from this product.

#### Assessment toxicity to reproduction

No known effects from this product.

#### Assessment teratogenicity

No known effects from this product.

#### Experiences with human exposure

Inhalation of vapours in high concentrations may cause shortness of breath (lung oedema).

Narcosis.

Irregular cardiac activity.

### SECTION 12: Ecological information

#### 12.1. Toxicity

##### Acute and prolonged toxicity fish

Species: Zebra fish (Danio rerio)

Exposure time: 96 h

Value type: LC50

Value in standard unit mg/l: 777 mg/l

##### Acute and prolonged toxicity fish

Species: Daphnia magna

Exposure time: 48 h

Value type: EC50

Value in standard unit mg/l: 433 mg/l

#### 12.2. Persistence and degradability

No data available.

##### Biodegradation

Not readily biodegradable.

#### 12.3. Bioaccumulative potential

No data available.

#### 12.4. Mobility in soil

No data available.

## Safety data sheet Chlorodifluoromethane (R 22)

Creation date : 28.01.2005  
Revision date : 09.05.2011

Version : 1.3

GB / E

SDS No. : 027  
page 4 / 5

### 12.5. Results of PBT and vPvB assessment

No data available.

### 12.6. Other adverse effects

#### Global Warming Potential GWP

When discharged in large quantities may contribute to the greenhouse effect.

1.810

#### Ozone Depleting Potential ODP

Covered by the 'Montreal Protocol'.

Hazardous to the ozone layer.

0,055

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Must not be discharged to atmosphere. Consult supplier for specific recommendations. Gases in pressure containers (including halons) containing dangerous substances

**EWC Nr. 16 05 04\***

## SECTION 14: Transport information

### ADR/RID

#### 14.1. UN number

1018

#### 14.2. UN proper shipping name

CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)

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

Class: 2

Classification Code: 2A

Labels: 2.2

Hazard number: 20

Tunnel restriction code: (C/E)

Emergency Action Code: 2TE

#### 14.4. Packing group (Packing Instruction)

P200

#### 14.5. Environmental hazards

None.

#### 14.6. Special precautions for user

None.

### IMDG

#### 14.1. UN number

1018

#### 14.2. UN proper shipping name

CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)

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

Class: 2.2

Labels: 2.2

EmS: F-C, S-V

#### 14.4. Packing group (Packing Instruction)

P200

#### 14.5. Environmental hazards

None.

### 14.6. Special precautions for user

None.

### 14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

### IATA

#### 14.1. UN number

1018

#### 14.2. UN proper shipping name

CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)

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

Class: 2.2

Labels: 2.2

#### 14.4. Packing group (Packing Instruction)

P200

#### 14.5. Environmental hazards

None.

#### 14.6. Special precautions for user

None.

### Other transport information

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 that they are firmly secured. Ensure that the cylinder valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

## SECTION 15: Regulatory information

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

Seveso Directive 96/82/EC: Not covered.

### Other regulations

Use of the substance may be subject to registration and authorisation (Regulation on substances that deplete the Ozone Layer(EC) No 1005/2009.)

### 15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

## SECTION 16: Other information

Ensure all national/local regulations are observed. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

### Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

### Further information

## Safety data sheet Chlorodifluoromethane (R 22)

Creation date : 28.01.2005  
Revision date : 09.05.2011

Version : 1.3

GB / E

SDS No. : 027  
page 5 / 5

---

**Note:**

When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line.

As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

---

**End of document**