Chlorodifluoromethane (Refrigerant Gas R22)
Safety Data Sheet P-4667
Date of issue: 01/01/1979   Revision date: 10/24/2016   Supersedes: 10/01/2014

SECTION: 1. Product and company identification

1.1. Product identifier
Product form: Substance
Name: Chlorodifluoromethane (Refrigerant Gas R22)
CAS No: 75-45-6
Formula: CHClF2
Other means of identification: Chlorodifluoromethane (Refrigerant Gas R22)

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture: Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet
Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number
Emergency number: Onsite Emergency: 1-800-645-4633
CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
GHS-US classification
Liquefied gas  H280

2.2. Label elements
GHS-US labeling
Hazard pictograms (GHS-US):

<table>
<thead>
<tr>
<th>pictogram</th>
<th>hazard description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="pictogram" /></td>
<td>WARNING</td>
</tr>
</tbody>
</table>

Signal word (GHS-US): WARNING
Hazard statements (GHS-US):
- H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
- H420 - HARMS PUBLIC HEALTH AND THE ENVIRONMENT BY DESTROYING OZONE IN THE UPPER ATMOSPHERE
- OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
- CGA-HG01 - MAY CAUSE FROSTBITE

Precautionary statements (GHS-US):
- P202 - Do not handle until all safety precautions have been read and understood
- P262 - Do not get in eyes, on skin, or on clothing
- P271 + P403 - Use and store only outdoors or in a well-ventilated place
- CGA-PG05 - Use a back flow preventive device in the piping
- CGA-PG06 - Close valve after each use and when empty
- CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

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

EN (English US)   SDS ID: P-4667   1/9

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SECTION 3: Composition/Information on ingredients

3.1. Substance

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane (Refrigerant Gas R22) (Main constituent)</td>
<td>(CAS No) 75-45-6</td>
<td>100</td>
</tr>
</tbody>
</table>

3.2. Mixture

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: Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Consult an eye specialist immediately. Immediately flush eyes thoroughly with water for at least 15 minutes. 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, both acute and delayed

No additional information available

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

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for firefighters

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 OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting: Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters: Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

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.

6.1.1. For non-emergency personnel
No additional information available

6.1.2. For emergency responders
No additional information available

6.2. Environmental precautions
Try to stop release.

6.3. Methods and material for containment and cleaning up
No additional information available

6.4. Reference to other sections
See also sections 8 and 13.

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.

7.3. Specific end use(s)
None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)</th>
<th>ACGIH</th>
<th>ACGIH TLV-TWA (ppm)</th>
<th>USA OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACGIH</td>
<td>1000 ppm</td>
<td>Not established</td>
</tr>
<tr>
<td></td>
<td>USA OSHA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.2. Exposure controls

Appropriate engineering controls: Ensure exposure is below occupational exposure limits (where available). Product to be handled in a closed system. 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.

Hand protection: Wear working gloves when handling gas containers.

Eye protection: Wear safety glasses with side shields or goggles when transfilling or breaking transfer connections. Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections.


Thermal hazard protection: Wear cold insulating gloves when transfilling or breaking transfer connections. 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: Wear safety shoes while handling containers.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Gas
Appearance: Clear, colorless gas. Liquefied compressed gas.
Molecular mass: 86.5 g/mol
Color: Colorless.
Odor: Slightly ethereal Odor >20% concentration
Odor threshold: No data available
pH: Not applicable.
Relative evaporation rate (butyl acetate=1): No data available
Relative evaporation rate (ether=1): Not applicable.
Melting point: -157 °C
Freezing point: -160 °C
Boiling point: -40.7 °C
Flash point: No data available
Critical temperature: 96.1 °C
Auto-ignition temperature: 632 - 635 °C
Decomposition temperature: > 260 °C
Flammability (solid, gas): No data available
Vapor pressure: 910 kPa
Critical pressure: 4990 kPa
Relative vapor density at 20 °C: 3.581 kg/m³ absolute vapor density @at 21.1°C, 1 atm
Relative density: 3.87 at 0°C, Air = 1
Density: 1.21 g/cm³ (at 20 °C)
Relative gas density: 3
Solubility: Water: 3628 mg/l
Log Pow: 1.08
Log Kow: Not applicable.
Viscosity, kinematic: Not applicable.
Viscosity, dynamic: Not applicable.
Explosive properties: Not applicable.
Oxidizing properties: None.
Explosion limits: Non flammable.
### 9.2. Other information

<table>
<thead>
<tr>
<th>Gas group</th>
<th>Liquefied gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional info</td>
<td>Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level</td>
</tr>
</tbody>
</table>

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

#### 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


#### 10.6. Hazardous decomposition products

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

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

- **Acute toxicity**: Not classified

<table>
<thead>
<tr>
<th>Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (ppm)</td>
</tr>
<tr>
<td>ATE US (gases)</td>
</tr>
</tbody>
</table>

- **Skin corrosion/irritation**: Not classified  
  pH: Not applicable.

- **Serious eye damage/irritation**: Not classified  
  pH: Not applicable.

- **Respiratory or skin sensitization**: Not classified

- **Germ cell mutagenicity**: Not classified

- **Carcinogenicity**: Not classified

#### Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)

<table>
<thead>
<tr>
<th>IARC group</th>
<th>3 - Not classifiable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Not classified</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### SECTION 12: Ecological information

#### 12.1. Toxicity

- **Ecology - general**: No ecological damage caused by this product.
12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
</tr>
<tr>
<td>Not readily biodegradable.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCF fish 1</td>
</tr>
<tr>
<td>(no significant bioaccumulation)</td>
</tr>
<tr>
<td>Log Pow</td>
</tr>
<tr>
<td>1.08</td>
</tr>
<tr>
<td>Log Kow</td>
</tr>
<tr>
<td>Not applicable.</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
</tr>
<tr>
<td>Not expected to bioaccumulate due to the low log Kow (log Kow &lt; 4). Refer to section 9.</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Chlorodifluoromethane (Refrigerant Gas R22) (75-45-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility in soil</td>
</tr>
<tr>
<td>No data available.</td>
</tr>
<tr>
<td>Ecology - soil</td>
</tr>
<tr>
<td>Because of its high volatility, the product is unlikely to cause ground or water pollution.</td>
</tr>
</tbody>
</table>

12.5. Other adverse effects

Effect on ozone layer: Hazardous to the ozone layer, HARMs PUBLIC HEALTH AND THE ENVIRONMENT BY DESTROYING OZONE IN THE UPPER ATMOSPHERE

CFC group: VIII

Ozone depletion potential [R11=1]: 0.055

Global warming potential [CO2=1]: 1700

Effect on the global warming: Contains Fluorinated greenhouse gases covered by the Kyoto protocol

SECTION 13: Disposal considerations

13.1. Waste treatment methods

<table>
<thead>
<tr>
<th>Waste disposal recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not attempt to dispose of residual or unused quantities. Return container to supplier.</td>
</tr>
</tbody>
</table>

SECTION 14: Transport information

In accordance with DOT

<table>
<thead>
<tr>
<th>Transport document description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1018 Chlorodifluoromethane, 2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UN-No.(DOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN1018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proper Shipping Name (DOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class (DOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard labels (DOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 - Non-flammable gas</td>
</tr>
</tbody>
</table>

DOT Special Provisions (49 CFR 172.102): T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

Additional information

<table>
<thead>
<tr>
<th>Emergency Response Guide (ERG) Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>126</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>No supplementary information available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special transport precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>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:</td>
</tr>
<tr>
<td>- Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.</td>
</tr>
</tbody>
</table>
**Transport by sea**
UN-No. (IMDG): 1018  
Proper Shipping Name (IMDG): CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)  
Class (IMDG): 2 - Gases  
MFAG-No: 126

**Air transport**
UN-No. (IATA): 1018  
Proper Shipping Name (IATA): Chlorodifluoromethane  
Class (IATA): 2  
Civil Aeronautics Law: Gases under pressure/Gases nonflammable nontoxic under pressure

### SECTION 15: Regulatory information

#### 15.1. US Federal regulations

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane (Refrigerant Gas R22)</td>
<td>75-45-6</td>
<td></td>
</tr>
</tbody>
</table>

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Subject to reporting requirements of United States SARA Section 313  
SARA Section 311/312 Hazard Classes: Immediate (acute) health hazard, Sudden release of pressure hazard  
SARA Section 313 - Emission Reporting: 1.0 %  
All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

**WARNING:** Contains Chlorodifluoromethane (Refrigerant Gas R22), a substance(s) that harms public health and the environment by destroying ozone in the upper atmosphere.

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

#### 15.2. International regulations

**CANADA**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane (Refrigerant Gas R22)</td>
<td>75-45-6</td>
<td></td>
</tr>
</tbody>
</table>

Listed on the Canadian DSL (Domestic Substances List)

**EU-Regulations**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane (Refrigerant Gas R22)</td>
<td>75-45-6</td>
<td></td>
</tr>
</tbody>
</table>

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### 15.2.2. National regulations

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS No</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane (Refrigerant Gas R22)</td>
<td>75-45-6</td>
<td></td>
</tr>
</tbody>
</table>

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 Japanese ENCS (Existing & New Chemical Substances) inventory  
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)  
Japanese Pollutant Release and Transfer Register Law (PRTR Law)  
Listed on the Canadian IDL (Ingredient Disclosure List)  
Listed on INSQ (Mexican National Inventory of Chemical Substances)  
Listed on CICR (Turkish Inventory and Control of Chemicals)
**SECTION 16: Other information**

**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.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product.

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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**

2 - Normally stable, but can become unstable at elevated temperatures or pressures or may react with water with some release of energy, but not violently. 1 - Stability not indicated.

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California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm.
Chlorodifluoromethane (Refrigerant Gas R22)
Safety Data Sheet P-4667
Date of issue: 01/01/1979    Revision date: 10/24/2016    Supersedes: 10/01/2014

HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability : 0 Minimal Hazard
Physical : 2 Moderate Hazard

SDS US (GHS HazCom 2012) - 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.