

# SAFETY DATA SHEET

## FROSTBERG® R-22



### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product name : Frostberg® R-22

MSDS Number : 000000004872

Product Use Description : Refrigerant

Chemical Family : Hydrochlorofluorocarbon (HCFC)

Molecular Formula : CHClF<sub>2</sub>

Company : FROSTBERG INTERNATIONAL LLC  
16192 Coastal Highway Lewes,  
Delaware 19958, USA

For more information : [www.frostbergint.com](http://www.frostbergint.com)

### SECTION 2: HAZARDS IDENTIFICATION

Form : Liquefied gas

Color : Colorless

Odor : Slight

Classification : Liquefied gas.

#### Label Elements

Symbol



Signal Word : Warning

Hazard Statement : Contains gas under pressure; may explode if heated.  
May displace oxygen and cause rapid suffocation.

Precautionary Statements : Protect from sunlight. Store in a well-ventilated place.

### SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

#### Concentration

| Substance Name       | CAS No. | Concentration |
|----------------------|---------|---------------|
| Chlorodifluoroethane | 75-45-6 | 99.80%        |

R22, HCFC-22, monochlorodifluoromethane, Algeon 22, Algofrene 22, Frigen 22, Solkane 22

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|                   |  |
|-------------------|--|
| Molecular Formula | CHClF <sub>2</sub>                       |
| Molecular Mass    | 86,47 g/mol                              |
| SMILES Notation   | C(F)(F)Cl                                |
| InChI             | InChI=1/CHClF <sub>2</sub> /c2-1(3)4/h1H |

### SECTION 4: FIRST AID MEASURES

|              |  |
|--------------|--|
| Inhalation   | Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or shows sign of failing. Obtain immediate medical attention.  |
| Skin Contact | Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to skin in the case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If irritation or blistering occur obtain medical attention. |
| Eye Contact  | Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least 10 minutes. Obtain immediate medical attention.  |
| Ingestion    | Ingestion is not considered a potential route of exposure.   |
| Treatment    | Symptomatic treatment and supportive therapy as indicated. Adrenaline and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.   |

### SECTION 5: FIRE-FIGHTING MEASURE

#### Extinguishing Media

|   |  |
|---|--|
| Suitable Extinguishing Media                                    | Water spray.<br>Carbon dioxide<br>Extinguishing foam<br>Product itself doesn't burn but packaging may be flammable.<br>Extinguishing agents should be oriented to the fire surroundings.   |
| For Safety Reasons Unsuitable Extinguishing Agents              | Water jet.   |
| Specific Hazard By-Product, Combustion Products Or Formed Gases | Exposure to fire may cause containers to rupture/explode. Nonflammable, but on heating release of toxic and corrosive fumes possible: hydrogen chloride HCl, hydrogen fluoride HF, carbon monoxide CO, carbonyl chloride COCl <sub>2</sub> , carbonyl fluoride COF <sub>2</sub> , chlorine Cl <sub>2</sub> . |

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Special Protective Actions For Fire-Fighters Use pressure air respirator at low aeration and in closed rooms. In extreme conditions a chemical protection suit might be necessary.

### SECTION 6: ACCIDENTAL RELEASE MEASURE

Personal Precautions Evacuate area, wear protective equipment, especially self-contained breathing apparatus when entering area unless atmosphere has been proved to be safe. Ensure adequate air ventilation.

Environmental Precautions Try to stop release. Prevent from entering sewers, basement and work pits, or any place where accumulation can be dangerous.

Methods For Cleaning Up Ventilate the area.

### SECTION 7: HANDLING AND STORAGE

Handling Handle with care.  
Avoid inhalation of vapor or mist.  
Do not get in eyes, on skin, or on clothing.  
Wear personal protective equipment.  
Use only in well ventilated areas.  
Pressurized containers. Protect from sunlight and do not expose to temperature exceeding 50°C.  
Follow all standards safety precautions for handling and use of compressed gas cylinders.  
Use authorized cylinders only.  
Protect cylinders from physical damage.  
Do not puncture or drop cylinders, expose them to open flame or excessive heat.  
Do not pierce or burn, even atier use. Do not spray on a naked flame or any incandescent material.  
Do not remove screw cap until immediately ready for use and always replace the cap atier use.

Storage Pressurized container: Protect from sunlight and do not expose to temperature exceeding 50 °C. Do not pierce or burn, even atier use.  
Keep containers tightly closed in a dry, cool and well ventilated place.  
Storage rooms must be properly ventilated.  
Ensure adequate ventilation, especially in confined areas.  
Protect cylinders from physical damage.

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Advice On Protection The product is not flammable.  
 Against Fire And Explosion Can form a combustibile mixture with air at pressure above atmospheric pressure.

### SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Control Parameters Guidelines

| EC Name               | EC No     | CAS No  | Type Of Limit Value      | 8 hr TWA                           | 15 Min Short Term Exposure         |
|-----------------------|-----------|---------|--------------------------|------------------------------------|------------------------------------|
| Chlorodifluoromethane | 200-871-9 | 75-45-6 | OEL (European Union)     | 1000 ppm<br>3600 mg/m <sup>3</sup> | N/A                                |
|                       |           |         | AGW – TRGS 900 (Germany) | 3600 mg/m <sup>3</sup>             | N/A                                |
|                       |           |         | MAK – OEL (Austria)      | 500 ppm<br>1800 mg/m <sup>3</sup>  | 1000 ppm<br>3600 mg/m <sup>3</sup> |
|                       |           |         | TWA (USA / NIOSH)        | 1000 ppm<br>3500 mg/m <sup>3</sup> | 1250 ppm<br>4375 mg/m <sup>3</sup> |

#### Exposure Controls

**Appropriate Engineering Controls** Ensure adequate ventilation.  
 Apply technical measures to comply with the occupational exposure limits.

**Body Protection**  
 Regular work clothing is generally sufficient.

**Respiratory Protection**  
 Required on release of the gaseous substance. Use half mask to EN 140 or full mask to EN 136 fitted with filter to EN 143-P1. Be aware of time limits. If concentration are above limitation of filter devices, if oxygen concentration are below 17% or if condition are ambiguous, use self-contained respiratory protective devices.

**Hand Protection**  
 Gloves should comply with specification of EU directive 89/686/EEC and EN 374. For example, on full contact 0.3mm thick butyl rubber gloves should be worn

**Eye Protection**  
 Sideward closed goggles to EN 166 are required.

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|                          |  |
|--------------------------|--|
| Skin And Body Protection | Foot protection is required when handling gas containers. Skin protection products are not as effective as gloves. If gloves cannot be worn, apply a water insoluble skin protection substance to clean skin before the start of work and after each break. Before breaks and at the end of shift, clean skin with soap and water. |
| Environmental Controls   | Exposure Avoid breathing the gaseous substance. Remove contaminated clothing. Don't smoke, eat and drink in the workplace.   |

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

|  |  |
|--|--|
| Physical State                         | Liquefied gas  |
| Color                                  | Colorless  |
| Odor                                   | Ethereal: Poor warning properties at low concentrations. |
| pH                                     | N/A  |
| Melting/Freezing Point                 | -160°C   |
| Boiling Point/Boiling Range            | -40.8°C  |
| Critical Temperature                   | 96.18°C  |
| Flash Point                            | N/A  |
| Flammability                           | Not flammable  |
| Evaporation Rate                       | >1   |
| Explosive Properties                   | Not Explosive  |
| Oxidizing Properties                   | Not oxidizing  |
| Vapor Pressure                         | 9081 hPa   |
| Gas Density                            | 0.0036 kg/dm <sup>3</sup>                                |
| Fluid Density                          | 1.210 kg/dm <sup>3</sup>                                 |
| Solubility                             | Soluble in ether, acetone, chloroform                    |
| Water Solubility                       | 3625 mg/l  |
| Partition Coefficient: n-octanol/water | $_{10}\log Pow: 1.13$ (CSCL Japan 1992)                  |
| Dynamic viscosity at 10°C              | 0.22 mPa*s   |
| Explosion Limits                       | Not determined   |

### SECTION 10: STABILITY AND REACTIVITY

|                                    |  |
|------------------------------------|--|
| Reactivity                         | Not reactive under normal conditions of use and storage.   |
| Possibility of hazardous reactions | Reacts violently with alkali earth metals. Catalytic decomposition in presence of powdery aluminum and zinc. |

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|                                  |  |
|----------------------------------|--|
| Conditions To Avoid              | Stable under normal conditions. Avoid open flames, high temperature, direct sun light.   |
| Material To Avoid                | Alkali and earth alkali metals.  |
| Hazardous Decomposition Products | Hydrogen chloride HCl, hydrogen fluoride HF, carbon monoxide CO, carbonyl chloride COCl <sub>2</sub> , carbonyl fluoride COF <sub>2</sub> , chlorine Cl <sub>2</sub> . |

### SECTION 11: TOXICOLOGICAL INFORMATION

|                           |  |
|---------------------------|--|
| Acute Inhalation Toxicity | LC50: > 3000000 ppm<br>Exposure time: 4 h<br>Species: rat  |
| Sensitization             | Cardiac sensitization<br>Species: dogs<br>Note: Chlorodifluoromethane (HCFC – 22): Cardiac Sensitization threshold (dog): 50000 ppm.   |
| Repeated Dose Toxicity    | Species: rat<br>Application Route: Inhalation<br>Exposure time: Lifetime Exposure<br>NOEL: 10000 ppm<br>Note: Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas. |
| Other Information         | Acute toxicity rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. May cause cardiac arrhythmia.                |

### SECTION 12: ECOLOGICAL INFORMATION

#### Eco Toxicity Effects

|   |   |
|---|---|
| Toxicity To Fish                                    | Static test<br>LC50: 777 mg/l<br>Exposure time: 96h<br>Species: Danio rerio (zebra fish)    |
| Toxicity To Daphnia And Other Aquatic Invertebrates | Static test<br>EC50: 433 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea) |

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### Further Information On Ecology

|                        |            |  |
|------------------------|------------|--|
| Additional Information | Ecological | Accumulation in aquatic organism is unlikely. This product contains greenhouse gases which may contribute to global warming. Do Not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.<br>This product is subjected to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR part 82.<br>Section 611 Requires the following label text on all shipments of this product.<br>Warning: Contains Chlorodifluoromethane (HCFC – 22), a substance which harms public health and environment by destroying ozone in the upper atmosphere.<br>Refer to sections 610 and 612 for list of acceptable and unacceptable uses for this product. |
|------------------------|------------|--|

### SECTION 13: DISPOSAL CONSIDERATIONS

|                  |   |
|------------------|---|
| Disposal Methods | Observe all Federal, State, and Local Environmental regulations   |
| Note             | This product is subjected to U.S. Environmental Protection Agency Clean Air Act Regulations Sections 608 in 40 CFR Part 82 regarding refrigerant recycling. |

### SECTION 14: TRANSPORT INFORMATION

|     |                      |                       |
|-----|----------------------|-----------------------|
| DOT | UN/ID No.            | 1018                  |
|     | Proper Shipping Name | Chlorodifluoromethane |
|     | Class                | 2.2                   |
|     | Packing Group        |                       |
|     | Hazard Labels        | 2.2                   |

|      |                                      |                       |
|------|--------------------------------------|-----------------------|
| IATA | UN/ID No.                            | 1018                  |
|      | Description Of Goods                 | Chlorodifluoromethane |
|      | Class                                | 2.2                   |
|      | Hazard Labels                        | 2.2                   |
|      | Packing Instruction (Cargo Aircraft) | 200                   |



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|      |  |                        |
|------|--|------------------------|
|      | Packing Instruction (Passenger Aircraft) | 200                    |
| IMDG | UN/ID No.                                | 1018                   |
|      | Proper Shipping Name                     | Cholorodifluoromethane |
|      | Class                                    | 2.2                    |
|      | Hazard Labels                            | 2.2                    |
|      | Ems Number                               | F – C, S – V           |
|      | Marine Pollutant                         | No                     |

SECTION 15: REGULATORY INFORMATION

Inventories

US. Toxic Substances Control Act On TSCA Inventory.

Australia: Industrial Chemical (Notification And Assessment) Act On the inventory, or in compliance with the inventory.

Canada: Canadian Environmental Protection Act (CEPA). Domestic Substances List. All components of this product are on the Canadian DSL.

Japan: Kashin-Hou Law List On the inventory, or in compliance with the inventory.

Korea: Toxic Chemical Control Law (TCCL) List On the inventory, or in compliance with the inventory.

Philippines: The Toxic Substances And Hazardous And Nuclear Waste Control Act On the inventory, or in compliance with the inventory.

China: Inventory Of Existing Chemical Substances On the inventory, or in compliance with the inventory.

New Zealand: NZIOC On the inventory, or in compliance with the inventory.

National Regulatory Information

SARA 302 Components: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302





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|                           |  |          |
|---------------------------|--|----------|
| SARA 313 Components:      | This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313   |          |
| SARA 311/312 Hazards:     | Acute Health Hazard.<br>Sudden Release of Pressure Hazard.   |          |
| California Prop. 65       | WARNING! This product contains a chemical known to the state of California to cause cancer, birth defects, or any other reproductive harm.<br><br>WARNING! This product contains a chemical known to the state of California to cause birth defects or other reproductive harm.<br>Chloromethane 74-87-3 |          |
| New Jersey RTK            | 1,1,1,2 - Tetrafluoroethane  | 811-97-2 |
| Pennsylvania RTK          | 1,1,1,2 - Tetrafluoroethane  | 811-97-2 |
| WHMIS Classification      | Compressed Gas:<br>This product has been classified according to the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.   |          |
| Global Warming Potential  | 1,653  |          |
| Ozone Depletion Potential | 0.06   |          |