

## Material Safety Data Sheet

Date:

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### SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**Product Name in English:** Refrigerants Gas R22

**Chemical name:** R22, HFA-22, HCFC-22

**Synonyms:** Chlorodifluoromethane; Difluoromochloromethane

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

**Supplier:** Global Refrigerants (S) Pte Ltd

**Address:** No.9 TUAS LINK 1, SINGAPORE 638587

**Website:** [www.globalrefrigerants.com.sg](http://www.globalrefrigerants.com.sg)

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### SECTION II- COMPOSITION/ INFORMATION ON INGREDIENTS

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INGREDIENT NAME	CAS NUMBER	Concentration %
Chlorodifluoromethane	75-45-6	>=99.95%

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### SECTION III – HAZARDS IDENTIFICATION

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**Hazardous Classification:** Class 2.2 Compressed Gas and Non-flammable Gas

**Primary Routes of Entry:** Inhalation

**Adverse Human Effects:**

**Skin:** Skin contact may cause frostbite from exposure to the liquid.

**Eyes:** Irritant. Liquid contact will irritate and may cause conjunctivitis.

**Inhalation:** HCFC-22 is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination. Increased pulse rate and deeper respiration will occur.

**Ingestion:** Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

**Environmental Hazards:** Hazardous product for the environment. No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus, It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

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### SECTION IV – FIRST AID MEASURES

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**Eyes:** Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite, water should not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

**Skin:** Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

**Inhalation:** Immediately remove patient to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine(adrenaline).

**Ingestion:** Ingestion is unlikely because of the physical properties and is not expected to be hazardous. DO NOT induce vomiting unless instructed to do so by a physician.

**Advice to Physician or First-Aiders:** A patient adversely affected by exposure to this product should not be given adrenalin (epinephrine) or similar heart stimulant since these would increase the risk of cardiac arrhythmias.

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### SECTION V – FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** : HCFC 22 is not flammable under ambient conditions of temperature and pressure. Certain mixtures of HCFC 22 and air when under pressure may be flammable. Mixtures of HCFC and Chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours.

**Hazardous Products of Combustion:** Decomposition products include hydrochloric acid, and carbonyl halides, such as phosgene.

**Fire Fighting Instructions:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Cool containers / tanks with water spray. In the event of fire, wear self-contained breathing apparatus.

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### SECTION VI – ACCIDENTAL RELEASE MEASURES

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**Personal Precautions:** Immediately contact emergency personnel. Use suitable protective equipment. Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

**Environmental Precautions:** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Methods for Cleaning-up:** Let the product evaporate.

**In Case of Spill or Other Release:** (Always wear recommended personal protective equipment.) Evacuate unprotected personnel. protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low lying areas.

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### SECTION VII – HANDLING AND STORAGE

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**Handling:** (Always wear recommended personal protective equipment.); Avoid breathing vapours and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders. Follow standard safety precautions for handling and use of compressed gas cylinders. R22 should not mixed with air above atmospheric pressure for leak testing or any other purpose.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52°C .

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### SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

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**Authorized Limit Values: Chlorodifluoromethane**

TLV (ACGIH-USA) 2001: TWA = 1.000 ppm TWA = 3.540 mg/m<sup>3</sup>

**Engineering Controls:** Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

**Respiratory Protection:** For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

**Hand protection:** Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

**Eye Protection:** Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

**Skin Protection:** Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

**Personal Protection in case of a large spill:** A self-contained breathing apparatus should be used to avoid inhalation of the product.

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### SECTION IX – PHYSICAL & CHEMICAL PROPERTIES

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**Appearance:** Gas at ambient temperatures

**Colour:** Colourless

**Odour:** Slight, ether-like

**Molecular Weight:** 86.45

**Boiling Point(1,013 hPa):** -40.8°C

**pH:** Neutral

**Vapour Pressure:** 9.08 bar (20°C)

**Vapour Density (air=1.0):**3.0

**Partition Coefficient(noctanol/water): log Po/w:** 1.08

**Solubility:** 0.3 wt% (25° C)

**Specific Use (s):** Refrigerant, foaming agent, and new type pesticide.

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### SECTION X – Stability AND REACTIVITY

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**Stability:** Stable under normal conditions of handling and use.

**Incompatibility With other Materials:** (Under specific conditions: e.g. very high temperatures and/or appropriate pressures) - Freshly abraded aluminium surfaces (may cause strong exothermic reaction). Chemically active metals for example sodium, potassium, calcium, magnesium, zinc, alkaline metals and their alloys.

**Hazardous Decomposition Products :** Decomposes at fire temperatures to halogenated compounds, hydrogen chloride, hydrogen fluoride.

**Hazardous Polymerization:** Will not occur.

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### SECTION XI - - TOXICOLOGICAL INFORMATION

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**Acute Toxicity:**

**LC50 : 4 hr.** (rat) -  $\geq 300,000$  ppm, 21,9 %

Cardiac Sensitization threshold (dog) -50,000 ppm

**Irritation:** Rabbit, slightly irritant (skin) / Rabbit, slightly irritant (eyes)

**Sensitization:** Guinea Pig, Non sensitizing (skin)

**Chronic toxicity:** Inhalation, after a single exposure, dog,  $\geq 5$  % v/v air, cardiac sensitization following adrenergic stimulation; Inhalation, after prolonged exposure, rat, Target organ: eyes, 5 % v/v air, teratogenic effect, Remark: High dose

**Other Data:** Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

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### SECTION XII – ECOLOGICAL INFORMATION

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**Acute ecotoxicity:** Result: no data

**Abiotic degradation:**

**Degradation's products:** carbon dioxide / hydrochloric acid / fluorhydric acid

**Air, photolysis, ODP** = 0.055 (CFC 11: ODP = 1).

Result: limited effect on stratospheric ozone.

Reference value for Air, greenhouse effect, GWP =0.36 (CFC 11: GWP = 1).

**Potential for bioaccumulation**

Bioconcentration:  $\log Po/w = 1.08$  Result: non-bioaccumulable

**Comments:** Product is persistent air (atmospheric lifetime: 14 years).

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### SECTION XIII – DISPOSAL CONSIDERATIONS

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**Nature of the Waste:** Not a RCRA hazardous waste.

**Waste Treatment:** Waste from residues / unused products: Can be used after re-conditioning. Product removed from the cylinder must be disposed of in accordance with appropriate National and local regulation. Return cylinders with residual product to the supplier .

**Disposal Considerations:** Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to supplier. Do not dispose of locally.

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### SECTION XIV – TRANSPORT INFORMATION

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**Classification Code:** 22039.

**UN-No.:** 1018.

**Marking:** 5

**Primary label:** Non-combustible Gas.

**Packing group:** III.

**Packing Method:** Steel cylinders.

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### SECTION XV – REGULATORY INFORMATION

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\*Common dangerous chemical classification and labelling (GB13690-92).

\*Regulations on the Control over Safety of Dangerous Chemicals (State Council Decree 344 [2002])

\*Regulations on the Safety Use of Chemicals in workplaces (Department of Labor, Reg 423 [1996], are enacted to control the safe use, production, storage, transport, operation, trade and disposal of dangerous chemicals.

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