



Safety Data Sheet

Product:

R22

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Revision Date: 05/11/2018

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product Name	Chlorodifluoromethane
Other/Generic Names	R22; HCFC-22
Chemical Formula	CHCLF2
Product Use	Refrigerant
Company Identification	BNF Industries Pte Ltd 17 Changi South Street 1, Singapore 486781
Emergency phone number	(65) 6742 6118
Fax	(65) 6742 6119

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification acc. to WHS Regulation

H280	Gases under pressure: Compressed gas
H420	Hazardous to ozone layer – category 1

Label elements

Hazard Pictograms:



Signal Word: Warning

Hazard Statement(s):

H280	Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.
H420	Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary Statements:

P410+P403 Protect from sunlight. Store in a well-ventilated place.

Other hazards:

Dangerous for the ozone layer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation:	Substance
Components/Impurities:	Contains no other components or impurities which will influence the classification of the product.

CAS No.:	75-45-6
Index No.:	-
EC No. (from EINECS):	200-871-9
REACH Registration No.:	N/A

4. FIRST AID MEASURES

First Aid 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.

First Aid Eyes:

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

First Aid Inhalation:

Immediately remove 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).

First Aid 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: Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES

Extinguishing media

Use any standard agent – Carbon dioxide, dry chemical or water spray

Fire fighting instructions

If possible stop the flow of gas supply. Use water spray to cool adjacent areas.

Fire and Explosion Hazards

R-22 is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

6. ACCIDENTAL RELEASE MEASURES

In case of Spill or Leak

Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep upwind. Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation. Exhaust vapors outdoors. Do not smoke or operate internal combustion engines. Remove flames and heating elements.





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7. HANDLING AND STORAGE

Normal Handling (Always wear recommended PPE)
Avoid breathing vapors 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 only. Follow standard safety precautions for handling and use of compressed gas cylinders.

Storage recommendations
Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls
Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

Eye/Face Protection
For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

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.

Respiratory Protection
None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

Additional Recommendations
Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quickdrench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Colour: Clear, colourless liquid and vapour
Physical State: Gas at ambient temperatures
Molecular Weight: 86.45 g/mol
Chemical Formula: CHClF₂

Odour: Faint ethereal odour
Odour Threshold: No data available
pH: Neutral
Boiling Point: -40.8 °C
Freezing Point: -160 °C
Flash Point: N/A
Evaporation Rate: >1 (CCL4 = 1.0)
Flammability: Non-flammable
Flammability Range: N/A
Auto-ignition temperature: 632 - 635 °C
Decomposition temperature: 632 °C
Viscosity, dynamic: 0.22 mPa.s (10 °C)
Vapor Pressure: 9.135 bar (20 °C)
Vapor Density: 3.0 (air = 1.0)
Relative Density: 1.19 (25 °C)
Water Solubility: 2.6 g/l (25 °C)
Partition coefficient, n-octanol/water: log Pow: 0.053
Global warming potential (GWP): 0.055
Ozone depletion potential (ODP): 1,810

10. STABILITY AND REACTIVITY

Reactivity
Not classified as a reactivity hazard.

Chemical Stability
Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.

Possibility of hazardous reactions
Can react with strong oxidizing agents

Conditions to avoid
Heat, flames and sparks

Incompatible materials
Oxidizing agents

Hazardous decomposition products
No hazardous decomposition products are known.

11. TOXICOLOGY INFORMATION

Acute toxicity
LC50: Inhalation 4 hr. (rat) - > 300,000 ppm
Cardiac Sensitization threshold (dog) - 50,000 ppm

Skin corrosion/irritation
Not classified based on available information.





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Serious eye damage/eye irritation

Not classified based on available information.

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

IARC No ingredient of this product presents at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product presents at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity to fish

LC50 (Zebrafish, 96h): 777 mg/l

Toxicity to daphnia and other aquatic invertebrates

EC50 (Daphnia magna, 48h): 433 mg/l

Toxicity to algae

EC50 (algae, 96h): 250 mg/l

Biodegradability

Not applicable to gases and gas mixtures.

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Results of PBT and vPvB assessment

Not classified as PBT or vPvB

Global Warming Potential

1,810

Contains fluorinated greenhouse gases covered by the Kyoto protocol. When discharged in large quantities may contribute to the greenhouse effect.

Ozone-Depletion Potential

0.055

13. DISPOSAL CONSIDERATIONS

Waste from residues

Dispose of in accordance with local regulations

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Empty pressure vessels should be returned to the supplier. If not otherwise specified, dispose of as unused product.

14. TRANSPORT INFORMATION

ADD/RID

UN number: UN 1018
Proper shipping name: Chlorodifluoromethane (R22)
Class: 2
Classification code: 2A
Hazard number: 20
Tunnel restriction code: (C/E)
Emergency action code: 2TE
Packing group: P200
Labels: 2.2

IMDG

UN number: UN 1018
Proper shipping name: Chlorodifluoromethane (R22)
Class: 2.2
Packing group: Not assigned by regulation
Labels: 2.2
EmS Code: F-C, S-V
Marine pollutant: No

IATA

UN number: UN 1018
Proper shipping name: Chlorodifluoromethane (R22)
Class: 2.2
Packing group: Not assigned by regulation
Labels: Non-flammable, non-toxic Gas
Packing instruction: 200

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

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 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. Ensure that the container valve is closed and not leaking.





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15. REGULATORY INFORMATION

Classification and labelling

The product may be due to classification and labelling according to national regulations in each case.

Other regulation and guidance

The provisions of occupational, health, environment and consumer protection shall apply to the country where the chemical substance or mixture is placed on the market.

16. OTHER INFORMATION

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. 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.

This MSDS is for information purposes only and is subject to change without notice.

