Safety Data Sheet

According to Regulation (EU) No. 1907/2006 (REACH), Annex II

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name:	REFRIGERANT 22
Substance name:	Chlorodifluoromethane
REACH Reg. No.:	not available
CAS No.:	75-45-6
EC No.:	200-871-9

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

Identified uses:	Used as refrigerants, aerosol insecticide.
Uses advised against:	No uses advised against.

1.3 Details of the Manufacturer of the SDS

Manufacturer:	Zhejiang Quhua Fluor Chemistry Co.,Ltd
Address:	Juhua Group Corporatiom,Kecheng district,Quzhou city,Zhejiang province

Section 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008[CLP]

Gases under pressure (Liquefied gases); H280

HAZARD TO THE OZONE LAYER CATEGORY 1 ; H420

Classification according to Council Directive 67/548/EEC [DSD]

This product does not meet the criteria for classification in any hazard class according to Directive 67/548/EEC on classification, labelling and packaging of substances.

Additional information

Full text of H-statement(s): see section 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Substance name: Chlorodifluoromethane

Safety Data Sheet

According to Regulation (EU) No. 1907/2006 (REACH), Annex II

Hazard pictogram(s):

GHS04

Signal word: Warning

Hazard statements: H280: Contains gas under pressure; may explode if heated.
H420:Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary statements:

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

Supplemental Hazard information (EUH):

No information available.

Special rules for supplemental label elements for certain mixtures:

No information available.

2.3 Other hazards

This substance may be hazardous to the environment; special attention should be given to its impact on the ozone layer.

Section 3: Composition/information on ingredients

3.1 Substance information

Substance name	Synonym	CAS No.	EC No.	Molecular formula	Classification according to DSD	% (w/w)
Chlorodifluoromethane	HCFC-22	75-45-6	200-871-9	CHClF2	No classification.	100

Substance name	Synonym	CAS No.	EC No.	Molecular formula	Classification according to CLP	% (w/w)
Chlorodifluoromethane	HCFC-22	75-45-6	200-871-9	CHClF2	Press. Gas (Liq. gas); H280	100

Remark: The rest unspecified ingredients are impurities, and they are not hazard.
Full text of H-statement(s): see section 16.

Section 4: First aid measures

4.1 Description of first aid measure

General notes: In all cases of doubt, or when symptoms persist, seek medical attention.

Following inhalation:

If high concentrations are inhaled, immediately remove to fresh air. Keep person calm.

If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Following skin contact:

In cases of contact, immediately flush skin with plenty of water for at least 15 minutes.

Remove contaminated clothing and shoes. Call a physician.

Treat for frostbite if necessary by gently warming affected area.

Wash contaminated clothing before reuse.

Following eye contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes.

Call a physician.

Following ingestion:

Ingestion is not considered a potential route of exposure.

Notes for the doctor:

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life support.

Treat symptomatically and supportively.

Treatment may vary with condition of victim and specifics of incident.

4.2 Most important symptoms and effects, both acute and delayed

Potential Health Effects - Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

Human Health Effects - Contact with the liquid may cause frostbite. Overexposure by inhalation may include nonspecific discomfort, such as nausea, headache, or weakness, or temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures may lead to temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure.

Individuals with preexisting diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

4.3 Indication of the immediate medical attention and special treatment needed

Persons with pre-existing skin, eye, or respiratory disease may be at increased risk from the irritant or allergic properties of this material. Attending physician should treat exposed patients symptomatically.

Section 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media:

In case of fire in the surroundings: use appropriate extinguishing media.

Unsuitable extinguishing media:

For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Substance is incombustible.

Cylinders may rupture under fire conditions. Decomposition may occur.

5.3 Advice for fire-fighters

Shut off gas supply if this can be done safely. If possible, take container out of dangerous zone.

Cool cylinders with water spray. Self-contained breathing apparatus (SCBA) may be required if cylinders rupture or release under fire conditions.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Immediately contact emergency personnel. Keep unnecessary personnel away.

Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely.

Isolate area until gas has dispersed.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Discharge into the environment must be avoided.

6.3 Methods and material for containment and cleaning up

Ventilate area, especially low or enclosed places where heavy vapors might collect.

Remove open flames.

Use self-contained breathing apparatus (SCBA) if large spill or leak occurs. Evacuate area.

Comply with Federal, State and local regulations on reporting releases.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

Section 7: Handling and storage

7.1 Precautions for safe handling

Avoid breathing high concentrations of vapors and avoid liquid contact with skin or eyes.

Use in well ventilated area away from possible ignition sources.

Use with sufficient ventilation to keep employee exposure below recommended limits.

7.2 Conditions for safe storage, including any incompatibilities

Keep containers in cool clean and dry area. Do not heat above 52°C (125°F)

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

Section 8 : Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values:

CAS # 75-45-6	Occupational exposure limit values			
Country of origin	Long term/ Eight hours		Short term	
Austria	500 ppm	1800 mg/m³	1000 ppm	3600 mg/m³
Belgium	1000 ppm	3600 mg/m³	-	-
Canada - Québec	1000 ppm	3540 mg/m³	-	-
Denmark	500 ppm	1770 mg/m³	1000 ppm	3540 mg/m³
European Union	1000 ppm	3600 mg/m³	-	-
France	1000 ppm	3600 mg/m³	-	-
Germany (AGS)	-	3600 mg/m³	-	-
Germany (DFG)	500 ppm	1800 mg/m³	4000 ppm	14400 mg/m³
Hungary	-	3600 mg/m³	-	14400 mg/m³
Italy	1000 ppm	3600 mg/m³	-	-
Spain	1000 ppm	3600 mg/m³	-	-
Sweden	500 ppm	1800 mg/m³	750 ppm	2500 mg/m³
Switzerland	500 ppm	1800 mg/m³	-	-
The Netherlands	-	3600 mg/m³	-	-
USA - NIOSH	1000 ppm	3500 mg/m³	1250 ppm	4375 mg/m³
United Kingdom	1000 ppm	3590 mg/m³	-	-

8.2 Exposure controls

Appropriate engineering controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal protective equipment:

Eye and face protection: Sufficient eye protection should be worn. When handling compressed gas, at least glasses with side protection should be worn. When handling liquid gas, chemical safety goggles must be used as well as a protective shield.

Skin protection: Body protection:
Use protective boots while handling gas cylinders.
Hand protection:
Wear leather gloves to prevent frostbite injuries from rapidly expanding gas when handling pressurised gas bottles.

Respiratory protection: In an emergency (e.g.: unintentional release of the substance, exceeding the

occupational exposure limit value) respiratory protection must be worn. Consider the maximum period for wear. Wear self-contained breathing apparatus. Do not use filter respirator.

Environmental exposure controls:

Do not allow material to be released to the environment without the proper governmental permits.

Industrial hygiene:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Compressed liquefied gas.
Colour:	Clear, colorless
Odour:	Slight ethereal
pH:	Not available.
Melting point:	-146°C(-230.8°F)
Boiling point:	-40.8°C(-41.4°F)
Vapor Density:	3.03 at 25°C (77°F) (Air = 1)
Liquid Density:	1.194 g/cm^3 at 25°C (77°F)
Vapour pressure:	151 psig at 25°C (77°F)
Partition coefficient (n -octanol/water):	Log Pow = 1.13
Solubility in water:	0.3 WT % at 25°C (77°F)
Flash point:	Not applicable.
Critical Temperature:	96.2°C(205.2°F)
Critical Pressure:	4.91 Mpa
Flammability:	Not flammable.
Decomposition temperature:	No data available.
Explosive properties:	No data available.
Oxidising properties:	Non oxidizer.
Evaporation rate :	No data available.
Viscosity:	No data available.
Volatile:	100 WT%

9.2 Other information

No data available.

Section 10: Stability and reactivity

10.1 Reactivity

On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive gases

including hydrogen chloride, phosgene, hydrogen fluoride, carbonyl fluoride. Attacks magnesium and its alloys.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of hazardous reactions

Attacks magnesium and its alloys.

10.4 Conditions to avoid

Avoid open flames and high temperatures.

10.5 Incompatible materials

Incompatible with alkali or alkaline earth metals - powdered Al, An, Be, etc.

10.6 Hazardous decomposition products

This material can be decomposed by high temperatures.

On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive gases including hydrogen chloride, phosgene, hydrogen fluoride, carbonyl fluoride.

Section 11: Toxicological information

11.1 Toxicokinetics, metabolism and distribution

Chlorodifluoromethane inhaled by male Wistar rats at a concentration of 160 ppm (566 mg/cu m) underwent no detectable metabolism and prior treatment of rats with either DDT or phenobarbital did not stimulate its metabolic transformation. (HSDB)

11.2 Information on toxicological effects

Acute toxicity:

Acute Inhalation toxicity:	LC_{50} = 1000000 kg/m^3/2h (rat) (IUCLID);
Acute Oral toxicity:	The oral and dermal routes of exposure are not significant for chlorodifluoromethane. No informative studies of its acute toxicity by these routes have been reported (EU Risk assessment).
Acute Dermal toxicity:	

Skin corrosion/irritation:

Skin, rabbit: slightly irritant (EU Risk assessment).

Serious eye damage/irritation:

Eyes, rabbit: slightly irritant (EU Risk assessment).

Respiratory or skin sensitization:

Guinea pig maximization test: not sensitizing (IUCLID);

CMR effects (Carcinogenicity, Mutagenicity and Toxicity for Reproduction):

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

The substance or mixture is not classified as mutagens or toxic to reproduction.

STOT-single exposure and repeated exposure:

The substance or mixture is not classified as specific target organ toxicant, single exposure, repeated exposure.

Additional information:

No data available.

Section 12: Ecological information

12.1 Toxicity

Acute toxicity to fish:	LC_{50} = 777 mg/l/96h (EU Risk assessment);
Acute toxicity to daphnia:	EC_{50} = 433 mg/l/48h (EU Risk assessment);
Acute toxicity to bacteria:	Quantitative data on the acute bacteria toxicity of this product are not available.

12.2 Persistence and degradability

Not ready biodegradable (0 % BOD after 28 days) (EU Risk assessment).

12.3 Bioaccumulative potential

The low octanol-water partition coefficient indicated that chlorodifluoromethane is not likely to bioaccumulate. (EU Risk assessment).

12.4 Mobility in soil

Since chlorodifluoromethane is a gas under ambient conditions, most of the chemical released on soil will volatilize rapidly. Any chlorodifluoromethane which remains on soil will have a high potential for leaching into groundwater based on its estimated Koc of 35. However, chlorodifluoromethane's high volatility should effectively reduce this potential.(HSDB)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment information is not available as chemical safety assessment not conducted.

12.6 Other adverse effects

This substance may be hazardous to the environment; special attention should be given to its impact on the ozone layer.

Section 13: Disposal considerations

13.1 Waste treatment methods

Compressed gas cylinders can normally be returned to the manufacturer. pressurised cans are non-returnable and must be disposed of. Do not empty pressure vessels to the point of pressure compensation. Mark empty vessels to avoid confusion with full ones.

At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices.(HSDB)

Section 14: Transport information

14.1 Land transport (ADR/RID/GGVSE)

UN-No.:	1018
Official transport designation:	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)
Class:	2.2
Classification Code:	2A
Packing group:	-
Hazard label:	2.2

14.2 Sea transport (IMDG-Code/GGVSee)

Proper Shipping Name:	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)
Class:	2.2
UN-No.:	1018
Packing group:	-
EmS No.:	F-C, S-V
Marine pollutant:	No

14.3 Air transport (ICAO-TI/IATA-DGR)

Proper Shipping Name:	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)
Class:	2.2
UN-No.:	1018
Packing group:	-

14.4 Additional information

No data available.

Section 15: Regulatory information

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

EU regulation:

Authorisations:	No information available.
Restrictions on use:	No information available.
EINECS:	This substance is listed in the inventory.
DSD (67/548/EEC):	This substance is not listed in the Annex I.
Regulation (EC) No 2037/2000:	This substance is listed in the Annex I of Regulation (EC) No 2037/2000 on on substances that deplete the ozone layer.

Other chemical regulation:

USA - TSCA:	This substance is listed in the inventory.
Canada - DSL:	This substance is listed in the inventory.
Australia - AICS:	This substance is listed in the inventory.
Korea - ECL:	This substance is listed in the inventory.
Japan - ENCS:	This substance is listed in the inventory.
China - IECSC:	This substance is listed in the inventory.

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

Section 16: Other information

16.1 Abbreviations and acronyms

CLP:	EU regulation (EC) No 1272/2008 on classification, labelling and packaging of chemical substances and mixtures.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
EINECS:	European Inventory of Existing Commercial Chemical Substances.
IARC:	International agency for research on cancer.
RID:	European Rail Transport.
IMDG:	International Maritime Code for Dangerous Goods.
IATA:	International Air Transport Association.
DSD:	Dangerous Substance Directive (67/548/EEC).
TSCA:	Toxic Substances Control Act, The American chemical inventory.
DSL:	Domestic Substances List, The Canadian chemical inventory.
AICS:	The Australian Inventory of Chemical Substances.
ECL:	Existing Chemicals List, the Korean chemical inventory.
ENCS:	Japanese Existing and New Chemical Substances.
IECSC:	Inventory of existing chemical substances in China.

16.2 Key literature references and sources for data

ESIS IUCLID Dataset: European chemical Substances Information System.
HSDB: Hazardous Substances Data Bank.
ICSC: International Chemical Safety Cards.
NLM Dataset: United States National library of medicine.

16.3 Relevant H-statements

H-statements (code and full text):

H280: Contains gas under pressure; may explode if heated.

16.4 Training advice

Provide adequate information, instruction and training for operators.

16.5 Declare to reader

The information in this Safety Data Sheet (SDS) was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable. According to REACH Article 31(5), the SDS shall be supplied in an official language of the Member State(s) where the substance or mixture is placed on the market, unless the recipient Member State(s) concerned provide otherwise. It should also be noted that this SDS is applicable to the countries with English as an official language.

---------- End of the SDS ----------