



DuPont™ FREON® 22 Refrigerant

Version 2.0

Revision Date 09/20/2010

Ref. 130000024323

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : DuPont™ FREON® 22 Refrigerant
Tradename/Synonym : R-22
FREON® 22
CHLORODIFLUOROMETHANE
HCFC-22
DYMEL® 22

MSDS Number : 130000024323

Manufacturer : DuPont
1007 Market Street
Wilmington, DE 19898

Product Information : 1-302-774-1000
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Rapid evaporation of the liquid may cause frostbite.

Potential Health Effects

Skin

Chlorodifluoromethane : Contact with liquid or refrigerated gas can cause cold burns and frostbite.

Eyes

Chlorodifluoromethane : Contact with liquid or refrigerated gas can cause cold burns and frostbite.

Inhalation


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Chlorodifluoromethane : May cause: Central nervous system depression, Anaesthetic effects, dizziness, confusion, incoordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Target Organs

Chlorodifluoromethane : Central nervous system

Carcinogenicity

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Chlorodifluoromethane	75-45-6	100 %

SECTION 4. FIRST AID MEASURES

- Skin contact : Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.
- Eye contact : In case of eye contact Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
- Ingestion : Is not considered a potential route of exposure.
- General advice : Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

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Notes to physician : Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

SECTION 5. FIRE-FIGHTING MEASURES

Flammable Properties

Flash point : does not flash

Thermal decomposition : 632 °C (1,170 °F)

Fire and Explosion Hazard

: pressure build-up

Hazardous thermal decomposition products:

Carbon oxides

Hydrogen fluoride

Carbonyl fluoride

Carbonyl halides

Cylinders are equipped with pressure and temperature relief devices, but may still rupture under fire conditions. Decomposition may occur.

Suitable extinguishing media

: As appropriate for combustibles in area. Extinguishant for other burning material in area is sufficient to stop burning.

Firefighting Instructions

: In the event of fire, wear self-contained breathing apparatus. Wear neoprene gloves during cleaning up work after a fire.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions.

Cool containers / tanks with water spray. Water runoff should be contained and neutralized prior to release.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel)

: Evacuate personnel to safe areas. Ventilate the area. Refer to protective measures listed in sections 7 and 8 of the SDS.



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- Spill Cleanup : Evaporates.
- Accidental Release Measures : Should not be released into the environment. Ventilate area, especially low or enclosed places where heavy vapours might collect. Avoid open flames and high temperatures. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8 of the SDS. The product should not be mixed with air for leak testing or used with air for any other purpose above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided. Handle in accordance with good industrial hygiene and safety practice.
- Handling (Physical Aspects) : No special protective measures against fire required.
- Storage : Valve protection caps and valve cutlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Keep at temperature not exceeding 52°C. Do not store near combustible materials. Keep container tightly closed in a dry and well-ventilated place. Store in original container. Protect from contamination.
- Storage temperature : < 52 °C (< 126 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Engineering controls : Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.



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Personal protective equipment

- Respiratory protection : Under normal manufacturing conditions, no respiratory protection is required when using this product. 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 : Additional protection: Heat insulating gloves
- Eye protection : Safety glasses with side-shields Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.
- Protective measures : Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Exposure Limit Values

Chlorodifluoromethane
 TLV (ACGIH) 1,000 ppm TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Form : Liquefied gas
- Color : clear
- Odor : slight, ether-like
- pH : neutral
- Boiling point : -40.8 °C (-41.4 °F)
- % Volatile : 100 %
- Vapour Pressure : 10,439.0 hPa at 25 °C (77 °F)
- Density : 1.194 g/cm3 at 25 °C (77 °F)
- Water solubility : 26.0 g/l at 25 °C (77 °F)
- Vapour density : 3.03 at 25 °C (77 °F)
(Air = 1.0)
- Evaporation rate : > 1
(CCL4=1.0)


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SECTION 10. STABILITY AND REACTIVITY

- Stability : Stable under recommended storage conditions.
- Conditions to avoid : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions. Avoid open flames and high temperatures.
- Incompatibility : Alkali metals Alkaline earth metals, Powdered metals, Powdered metal salts
- Hazardous decomposition products : Hazardous thermal decomposition products: Carbon oxides, Hydrogen fluoride, Hydrogen chloride, Carbonyl fluoride, Fluorocarbons, Carbonyl halides
Decomposition products are hazardous., The exact nature of the decomposition products will depend upon exposure conditions - temperature, access to oxygen, high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides., These materials are toxic and irritating., Avoid contact with decomposition products
- Hazardous reactions : Polymerization will not occur.
Other burning materials may cause HCFC 22 to burn weakly.
Chlorodifluoromethane is not flammable at ambient temperatures and atmospheric pressure. However, chlorodifluoromethane has been shown in tests to be combustible at pressures as low as 60 psig at ambient temperature when mixed with air at concentrations of 65 volume % air. Experimental data have also been reported which indicate combustibility of HCFC 22 in the presence of certain concentrations of chlorine.

SECTION 11. TOXICOLOGICAL INFORMATION

- Chlorodifluoromethane
Inhalation 4 h LC50 : 220000 ppm , rat
- Inhalation : multiple species
Target Organs: Central nervous system



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		Central nervous system depression Hypoactivity Altered respiratory rate
Inhalation	:	
Inhalation	:	dog Cardiac sensitization
Skin irritation	:	No skin irritation, rabbit
Eye irritation	:	No eye irritation, rabbit
Skin sensitization	:	Did not cause sensitization on laboratory animals., guinea pig
Repeated dose toxicity	:	Inhalation Reduced body weight gain, Organ weight changes
Carcinogenicity	:	An increased incidence of tumours was observed in some laboratory animals but not in others. Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity	:	Evidence suggests this substance does not cause genetic damage in animals. Did not cause genetic damage in cultured mammalian cells. Experiments showed mutagenic effects in cultured bacterial cells.
Reproductive toxicity	:	Evidence suggests the substance is not a reproductive toxin in animals.
Teratogenicity	:	Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.
Further information	:	Cardiac sensitisation threshold limit : 175000 mg/m3

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity	
Chlorodifluoromethane	
96 h LC50	: Zebra fish 777 mg/l



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

Environmental Fate
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Biodegradability

: According to the results of tests of biodegradability this product is not readily biodegradable.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : Can be used after re-conditioning. Recover, reclaim by distillation, or remove to a permitted waste disposal facility. Comply with applicable Federal, State/Provincial and Local Regulations.

Environmental Hazards : Empty pressure vessels should be returned to the supplier.

SECTION 14. TRANSPORT INFORMATION

DOT UN number : 1018
 Proper shipping name : Chlorodifluoromethane
 Class : 2.2
 Labelling No. : 2.2
 Reportable Quantity : Chlorodifluoromethane

IATA_C UN number : 1018
 Proper shipping name : Chlorodifluoromethane

IMDG UN number : 1018
 Proper shipping name : Chlorodifluoromethane
 Class : 2.2
 Labelling No. : 2.2



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SECTION 15. REGULATORY INFORMATION

- SARA 313 Regulated Chemical(s) : Chlorodifluoromethane
- CERCLA Reportable Quantity : 1 lbs
Based on the percentage composition of this chemical in the product.: Chlorodifluoromethane
- California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known
- PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Chlorodifluoromethane
- NJ Right to Know Regulated Chemical(s) : Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Chlorodifluoromethane

SECTION 16. OTHER INFORMATION

		HMIS
Health	:	1
Flammability	:	0
Reactivity/Physical hazard	:	1
PPE	:	Personal Protection rating to be supplied by user depending on use conditions.

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 Before use read DuPont's safety information.
 For further information contact the local DuPont office or DuPont's nominated distributors.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at



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