



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont  
Material Safety Data Sheet

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"FREON" 22  
2008FR Revised 28-APR-2004  
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CHEMICAL PRODUCT/COMPANY IDENTIFICATION  
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Material Identification

Corporate MSDS Number : DU000025  
Formula : CHClF2  
Molecular Weight : 86.47  
CAS Name : "FREON" 22

Tradenames and Synonyms

Freon 22  
CHLORODIFLUOROMETHANE  
HCFC-22  
CC0335  
Dymel 22

Company Identification

MANUFACTURER/DISTRIBUTOR  
DuPont Fluoroproducts  
1007 Market Street  
Wilmington, DE 19898

PHONE NUMBERS

Product Information : 1-800-441-7515 (outside the U.S.  
302-774-1000)  
Transport Emergency : CHEMTREC 1-800-424-9300 (outside U.S.  
703-527-3887)  
Medical Emergency : 1-800-441-3637 (outside the U.S.  
302-774-1000)

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COMPOSITION/INFORMATION ON INGREDIENTS  
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Components

Material	CAS Number	%
*"FREON" 22 METHANE, CHLORODIFLUORO-	75-45-6	100

\* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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HAZARDS IDENTIFICATION  
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## # Potential Health Effects

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Intentional misuse or deliberate inhalation can be fatal. Vapors are heavier than air and pose a threat of suffocation if trapped in enclosed or low places. Liquid contact can cause frostbite. Inhalation may cause dizziness, headache, confusion, incoordination, and loss of consciousness.

Immediate effects of overexposure by inhalation may include central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Gross overexposure may cause irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Other effects include fatality from gross over-exposure.

Short-term overexposure by skin contact may cause frostbite, if liquid or escaping vapor contacts the skin. Repeated and/or prolonged exposure may cause defatting of the skin with itching, redness or rash. Data to evaluate the skin permeation hazard of this compound are insufficient. There are no reports of human sensitization.

Contact with the vapor or aerosol may cause eye irritation with tearing, pain or blurred vision.

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the central nervous system, cardiovascular system.

## Carcinogenicity Information

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

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FIRST AID MEASURES  
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## First Aid

## INHALATION

If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

## SKIN CONTACT

In case of contact, flush area with lukewarm water. Do not

## (FIRST AID MEASURES - Continued)

use hot water. If frostbite has occurred, call a physician.

## EYE CONTACT

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

## INGESTION

Ingestion is not considered a potential route of exposure.

## Notes to Physicians

THIS MATERIAL MAY MAKE THE HEART MORE SUSCEPTIBLE TO ARRHYTHMIAS. Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Flash Point : Will not burn  
Autodecomposition : 632 C (1170 F)

Other burning materials may cause "FREON" 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 "FREON" 22 in the presence of certain concentrations of chlorine.

## Fire and Explosion Hazards:

Cylinders may rupture under fire conditions. Decomposition may occur.

## Extinguishing Media

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

## Fire Fighting Instructions

Use water spray or fog to cool containers. Self-contained breathing apparatus (SCBA) is required if cylinders rupture or contents are released under fire conditions. Water runoff should be contained and neutralized prior to release.

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ACCIDENTAL RELEASE MEASURES  
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## Safeguards (Personnel)

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

## Accidental Release Measures

Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills or releases.

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HANDLING AND STORAGE  
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## Handling (Personnel)

Use with sufficient ventilation to keep employee exposure below recommended limits. "FREON" 22 should not be mixed with air for leak testing. In general, it should not be used or allowed to be present with high concentrations of air above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided.

## Storage

Clean, dry area. Do not heat above 52 C (125 F).

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## Engineering Controls

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

## Personal Protective Equipment

Impervious gloves and chemical splash goggles should be used when handling liquid. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

## Exposure Guidelines

## Exposure Limits

"FREON" 22

PEL (OSHA) : None Established  
TLV (ACGIH) : 1,000 ppm, 3,540 mg/m<sup>3</sup>, 8 Hr. TWA, A4  
AEL \* (DuPont) : None Established

\* 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.

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Boiling Point : -40.8 C (-41.4 F)  
Vapor Pressure : 151 psig @ 25 C (77 F)  
Vapor Density : 3.03 (Air=1.0) @ 25 C (77 F)  
% Volatiles : 100 WT%  
Evaporation Rate : >1 (CCl<sub>4</sub>=1.0)  
Solubility in Water : 0.3 WT% @ 25 C (77 F)  
pH : Neutral  
Odor : Slight ethereal  
Form : Liquified Gas.  
Color : Clear, Colorless.  
Liquid Density : 1.194 g/cm<sup>3</sup> @ 25 C (77 F)

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STABILITY AND REACTIVITY  
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## Chemical Stability

Material is stable. However, avoid open flames and high temperatures.

## Incompatibility with Other Materials

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

## Decomposition

Decomposition products are hazardous. "FREON" 22 can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides. These materials are toxic and irritating. Contact should be avoided.

## Polymerization

Polymerization will not occur.

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TOXICOLOGICAL INFORMATION  
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## # Animal Data

## INHALATION:

4 hour, LC50, rat: 220,000 ppm.

Inhalation 4 hour, LC50, rat: 220,000 ppm

Animal testing indicates this material is a slight eye irritant.

Animal testing indicates this material is a skin irritant, but not a skin sensitizer.

Long-term exposure by ingestion caused no significant toxicological effects.

Single inhalation exposure to high doses caused central nerv depression. inactivity or anaesthesia, lung noise, altered respiratory rate, histopathological changes of the liver, cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine. Repeated exposure caused no significant toxicological effects. Long-term exposure caused reduced weight gain, increased adrenals, kidney, liver, and pituitary weight.

In chronic inhalation studies, HCFC-22, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1000 ppm (v/v). Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. This material is not considered a unique developmental hazard to the conceptus. Reproductive data on male animals show no change in reproductive performance. Specific studies to evaluate the effect on female reproductive performance have not been conducted; however, limited information obtained from studies on developmental toxicity do not indicate adverse effects on female reproductive performance. This material produces genetic damage in bacterial cell cultures. In mammalian cell cultures and animals, this material has not produced genetic toxicity. In animal testing, this material has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage).

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ECOLOGICAL INFORMATION  
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## Ecotoxicological Information

## Aquatic Toxicity:

"FREON" 22

48 hour EC50 - Daphnia magna: 433 mg/L  
-----DISPOSAL CONSIDERATIONS  
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## Waste Disposal

Comply with Federal, State, and local regulations. Reclaim by distillation or remove to a permitted waste disposal facility.

  
-----TRANSPORTATION INFORMATION  
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## Shipping Information

DOT/IMO  
Proper Shipping Name : CHLORODIFLUOROMETHANE  
Hazard Class : 2.2  
UN No. : 1018  
DOT/IMO Label : NONFLAMMABLE GAS

## Shipping Containers

Tank Cars.  
Tank Trucks.  
Cylinders.

  
-----REGULATORY INFORMATION  
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## U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes  
Chronic : No  
Fire : No  
Reactivity : No  
Pressure : Yes

## HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No  
CERCLA Hazardous Substance : No

## (REGULATORY INFORMATION - Continued)

SARA Toxic Chemical - See Components Section

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OTHER INFORMATION  
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## NFPA, NPCA-HMIS

NPCA-HMIS Rating  
Health : 1  
Flammability : 0  
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

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The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : MSDS Coordinator  
> : DuPont Fluoroproducts  
Address : Wilmington, DE 19898  
Telephone : (800) 441-7515

# Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS