



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 5-OCT-1996  
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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 may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

## HUMAN HEALTH EFFECTS:

Skin contact with the liquid may include frostbite. Prolonged overexposure may cause defatting or dryness of the skin. Eye contact with liquid may include eye irritation with discomfort, tearing, or blurring of vision.

Inhalation may include 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.

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

## EYE CONTACT

## (FIRST AID MEASURES - Continued)

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

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

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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.

The compound is a skin irritant and a slight eye irritant, but is not a skin sensitizer in animals.

Effects from single high exposures include central nervous system depression, anesthesia, rapid breathing, lung congestion and microscopic liver changes. Cardiac sensitization occurred in dogs at 50,000 ppm or greater from the action of exogenous epinephrine.

No toxic effects or abnormal histopathological observations occurred in rats repeatedly exposed to concentrations ranging from 10,000 to 50,000 ppm (v/v). Long-term exposures to 50,000 ppm (v/v) of vapors produced organ weight increases and a decrease in body weight gain, but no increased mortality or adverse hematological effects. In chronic inhalation studies, "FREON" 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 1,000 ppm (v/v).

Long-term administration in corn oil produced no effects on body weight or mortality.

"FREON" 22 was mutagenic in some strains of bacteria in bacterial cell cultures, but not mammalian cell cultures or animals. It did not cause heritable genetic damage in mammals.

A slight, but significant increase in developmental toxicity was observed at high concentrations (50,000 ppm) of "FREON" 22, a concentration which also produced toxic effects in the adult animal. Based on these findings, and other negative developmental studies, "FREON" 22 is not considered a unique hazard to the conceptus. Studies of the effects of "FREON" 22 on male reproductive performance have been negative. 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 at concentrations up to 50,000 ppm.

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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