



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

Page 1

"FREON" 500 Refrigerant
2012FR Revised 7-OCT-1996

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"FREON" is a registered trademark of DuPont.

Corporate MSDS Number : DU001075
Formula : CCl₂F₂/CH₃CHF₂ (AZEOTROPE)

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)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*METHANE, DICHLORODIFLUORO- ("FREON" 12)	75-71-8	73.8
ETHANE, 1,1-DIFLUORO- (FC-152a)	75-37-6	26.2

* 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.

HAZARDS IDENTIFICATION

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:

(HAZARDS IDENTIFICATION - Continued)

Human health effects of overexposure by skin contact with the liquid may include frostbite or mild skin irritation with discomfort. "FREON" 12 has been infrequently associated with skin sensitization in humans. Eye contact with the liquid or high vapor concentrations may include eye irritation with discomfort, tearing, or blurring of vision. 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 (>20%) may lead to temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath; temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation; abnormal kidney function as detected by laboratory tests; or fatality from gross overexposure.

Individuals with preexisting diseases of the central nervous system, cardiovascular system, lungs or kidneys 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.

FIRST AID MEASURES

First Aid

INHALATION

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

SKIN CONTACT

In case of skin contact, flush with water for 15 minutes. Treat for frostbite if necessary by gently warming affected areas. Get medical attention if irritation is present.

EYE CONTACT

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

IF SWALLOWED

Ingestion is not considered a potential route of

(FIRST AID MEASURES - Continued)

exposure.

Notes to Physicians

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

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : Will not burn
Flammable limits in Air, % by Volume
LEL : Not applicable
UEL : Not applicable
Autoignition : Not determined

Autodecomposition Temperature:

Dichlorodifluoromethane: <760 deg C (<1400 deg F)
Difluoroethane : <445 deg C (<836 deg F)

Fire and Explosion Hazards:

Use water spray or fog to cool containers. Cylinders are equipped with temperature and pressure relief devices but may still rupture under fire conditions. Decomposition may occur.

Extinguishing Media

As appropriate for combustibles in area.

Fire Fighting Instructions

Self-contained breathing apparatus (SCBA) is required if cylinders rupture or release under fire conditions.

ACCIDENTAL RELEASE MEASURES

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 - Continued)

Accidental Release Measures

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

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors. Avoid liquid contact with skin or eyes. Use with sufficient ventilation to keep employee exposure below recommended limits.

Storage

Clean, dry area. Do not heat above 125 deg F.

EXPOSURE CONTROLS/PERSONAL PROTECTION

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 places.

Personal Protective Equipment

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

Exposure Guidelines

Applicable Exposure Limits

METHANE, DICHLORODIFLUORO- ("FREON" 12)

PEL (OSHA)	: 1,000 ppm, 4,950 mg/m3, 8 Hr. TWA
TLV (ACGIH)	: 1,000 ppm, 4,950 mg/m3, 8 Hr. TWA, A4
AEL * (DuPont)	: None Established

ETHANE, 1,1-DIFLUORO- (FC-152a)

PEL (OSHA)	: None Established
TLV (ACGIH)	: None Established
AEL * (DuPont)	: 1000 ppm, 8 Hr. TWA
WEEL (AIHA)	: 1000 ppm, 8 Hr. 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.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point : -33 C (-27 F)
Vapor Pressure : 232 psia at 54 deg C (130 deg F)
Vapor Density : 3.7 (Air = 1)
% Volatiles : 100 WT%
Evaporation Rate : (CCl4 = 1)
 Less than 1
Odor : Slight ethereal
Form : Liquified gas
Color : Colorless
Density : 1.16 g/cc at 25 deg C (77 deg F) - Liquid

Appearance : Clear

STABILITY AND REACTIVITY

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.

Polymerization

Polymerization will not occur.

Other Hazards

Decomposition : Decomposition products are hazardous.
"FREON" 500 Refrigerant can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

TOXICOLOGICAL INFORMATION

Animal Data

"FREON" 12

Inhalation 4-hour LC50: 800,000 ppm in rats
Oral ALD : >1000 mg/kg in rats

No significant irritation was seen when a mixture containing "FREON" 12 was sprayed onto the skin and eyes of animals.

(TOXICOLOGICAL INFORMATION - Continued)

Effects from single high exposure include anesthesia and irregular heartbeat (cardiac arrhythmias) due to the heart being made more sensitive to adrenalin (cardiac sensitization). Repeated high exposures altered respiratory function. Long-term studies showed no significant clinical, blood chemistry, or pathological effects following repeated or long term exposures.

Effects from repeated or long-term ingestion of this material include slight alterations in blood chemistry and body weight gain. No other clinical, biochemical or pathological signs of toxicity have been observed.

Tests in animals demonstrate no carcinogenic activity and no developmental or reproductive toxicity. The compound does not produce heritable genetic damage in animals or genetic damage in bacterial and mammalian cell cultures.

FC-152a

Inhalation 4-hour ALC: 383,000 ppm in rats
Oral ALD : >1500 mg/kg in rats

The compound is untested for skin or eye irritancy, and for animal sensitization. Effects of a single exposure to high levels include labored breathing, lung irritation, lethargy, incoordination and loss of consciousness. Cardiac sensitization occurred in dogs exposed to a concentration of 150,000 ppm in air and given an intravenous epinephrine challenge. Effects of repeated exposure include increased urinary fluoride, reduced kidney weight, and reversible kidney changes. Effects of a single high oral dose include weight loss and lethargy.

Tests in animals demonstrate no carcinogenic activity or developmental effects. Tests in animals for reproductive effects have not been performed. This compound does not produce genetic damage in bacterial cell cultures but has not been tested in animals.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

"FREON" 12: 48 hour EC50 - Daphnia magna: 95 mg/L.

DISPOSAL CONSIDERATIONS

Waste Disposal

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

TRANSPORTATION INFORMATION

Shipping Information

DOT

DOT/IMO

Proper Shipping Name : DICHLORODIFLUOROMETHANE AND
DIFLUOROETHANE AZEOTROPIC
MIXTURE

Hazard Class : 2.2

UN No. : 2602

DOT/IMO Label : NONFLAMMABLE GAS

Shipping Containers

Cylinders

Ton Tanks

Reportable Quantity : "FREON" 12: 5000 lbs/2270 kg

REGULATORY INFORMATION

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

LISTS:

Extremely Hazardous Substance	-No
CERCLA Hazardous Substance	-(Yes)*
Toxic Chemicals	-(Yes)*

*"FREON" 12 component only

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating

Health	: 1
Flammability	: 0
Reactivity	: 1

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

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