



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" 12/"FREON" 114 Fluorocarbon Blends
2195FR Revised 7-OCT-1996

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"FREON" is a registered trademark of DuPont.

Corporate MSDS Number : DU001201
Formula : CC12F2/C2C12F4

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 FLUOROCARBON)	75-71-8	0-100
* **ETHANE, 1,2-DICHLOROTETRAFLUORO ("FREON" 114 FLUOROCARBON)	76-14-2	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.

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. Causes skin and eye irritation.

HUMAN HEALTH EFFECTS:

Overexposure by skin or eye contact may include skin irritation with discomfort or rash; or eye irritation with discomfort, tearing, or blurring of vision. Overexposure by inhalation of the vapors may cause nonspecific discomfort, such as nausea, headache, or weakness; temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Gross overexposure may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation.

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.

FIRST AID MEASURES

First Aid

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.

SKIN CONTACT

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

EYE CONTACT

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

INGESTION

(FIRST AID MEASURES - Continued)

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 be used with special caution only 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 : >600 C (>1112 F)

Fire and Explosion Hazards:

Containers are equipped with pressure relief devices but may rupture under fire conditions. Decomposition may occur.

Extinguishing Media

As appropriate for combustibles in area.

Fire Fighting Instructions

Use water spray or fog to cool containers. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released 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

Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills. Comply with Federal, State, and local regulations on reporting releases.

HANDLING AND STORAGE

Handling (Personnel)

Wash thoroughly after handling.

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 or enclosed places.

Personal Protective Equipment

Impervious gloves should be used if liquid contact with the skin is possible. Chemical splash goggles should be available as needed to prevent liquid contact with the eyes. 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

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, 1,2-DICHLOROTETRAFLUORO ("FREON" 114

PEL (OSHA) : 1,000 ppm, 7,000 mg/m3, 8 Hr. TWA
TLV (ACGIH) : 1,000 ppm, 6,990 mg/m3, 8 Hr. TWA, A4
AEL * (DuPont) : None Established

*o yj T AEL * (DuPont) : None Established

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Evaporation Rate : (CCl4 = 1)
Greater than 1
pH : Neutral
Odor : Slight ethereal
Form : Liquified gas
Color : Clear, colorless

Composition Wt. %		Liquid Density	Vapor Pressure	Vapor Density (Air=1)	Boiling Point	
"FREON" 12	"FREON" 114	g/cc at 25 deg C 77 deg F	psia at 25 deg C 77 deg F		deg C	deg F
100	0	1.311	94.5	4.26	-29.7	-21.6
80	20	1.338	84.3	4.53	-26.7	-16.0
60	40	1.368	73.5	4.84	-22.8	-9.0
40	60	1.398	61.2	5.20	-17.8	0.0
20	80	1.425	46.9	5.61	-9.4	+15.0
0	100	1.456	31.0	6.09	+3.8	+38.8

STABILITY AND REACTIVITY

Chemical Stability

Blend components are 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. This blend 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 FLUOROCARBON

Inhalation 30-minute LC50: 800,000 ppm in rats
Oral ALD : >1000 mg/kg in rats

The compound is not a skin irritant, but is a mild eye irritant. Effects in animals from single, high exposure by inhalation include anesthesia and irregular heartbeat (cardiac arrhythmias). Repeated inhalation exposures produced altered respiratory function. Long-term studies showed no significant clinical, blood chemistry or pathological effects following repeated exposures. The effects in animals from 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.

"FREON" 114 FLUOROCARBON

Inhalation 30-minute LC50: 720,000 ppm in rats
Oral ALD : >2250 mg/kg in rats

The compound is a mild skin and eye irritant. Toxic effects described in animals following a single, high exposure by inhalation include central nervous system depression with anesthesia, heart irregularities (cardiac sensitization) and altered blood pressure, and respiratory irritation. Repeated inhalation exposures to rats and mice at 200,000 ppm caused slight hematological effects and respiratory irritation. In a study with mice exposed for 23 months to a mixture containing CFC 114 showed no evidence of carcinogenicity. The compound does not produce genetic damage in bacterial cell cultures.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

"FREON" 12:

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

(ECOLOGICAL INFORMATION - Continued)

"FREON" 114 Fluorocarbon:

96-hour LC50 in killifish is 45 ppm.

DISPOSAL CONSIDERATIONS

Waste Disposal

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

TRANSPORTATION INFORMATION

Shipping Information

DOT

DOT/IMO

Proper Shipping Name : LIQUEFIED GAS, N.O.S. (CONTAINS
DICHLORODIFLUOROMETHANE AND
DICHLOROTETRAFLUOROETHANE)

Hazard Class : 2.2

UN No. : 3163

DOT/IMO Label : NONFLAMMABLE GAS

Shipping Containers

Tank Cars.
Tank Trucks.

Cylinders

Ton Tanks

Reportable Quantity : Dichlorodifluoromethane: 5000 lbs

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

(REGULATORY INFORMATION - Continued)

LISTS:

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

*"FREON" 12 Fluorocarbon 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