



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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6116FR USED REFRIGERANTS AND REFRIGERANT BLENDS
Revised 7-MAY-2004

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Tradenames and Synonyms

USED REFRIGERANT 11
USED REFRIGERANT 12
USED REFRIGERANT 13
USED REFRIGERANT 13B1
USED REFRIGERANT 14
USED REFRIGERANT 22
USED REFRIGERANT 23
USED REFRIGERANT 113
USED REFRIGERANT 114
USED REFRIGERANT 116
USED REFRIGERANT 123
USED REFRIGERANT 124
USED REFRIGERANT 125
USED REFRIGERANT 134a
USED REFRIGERANT 407C
USED REFRIGERANT 410A
USED REFRIGERANT 500
USED REFRIGERANT 502
USED REFRIGERANT 503
USED REFRIGERANT 508B
USED REFRIGERANT HP62
USED REFRIGERANT HP80
USED REFRIGERANT HP81
USED REFRIGERANT MP39
USED REFRIGERANT MP52
USED REFRIGERANT MP66

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont
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	%
REFRIGERANT COMPONENTS		
*METHANE, TRICHLOROFLUORO- (Refrigerant 11)	75-69-4	<100
*METHANE, DICHLORODIFLUORO- (Refrigerant 12)	75-71-8	<100
*METHANE, CHLOROTRIFLUORO- (Refrigerant 13)	75-72-9	<100
*METHANE, CHLORODIFLUORO- (Refrigerant 22)	75-45-6	<100
METHANE, TRIFLUORO- (HFC-23)	75-46-7	<100
DIFLUOROMETHANE (HFC-32)	75-10-5	<30
*1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (Refrigerant 113)	76-13-1	<100
*ETHANE, 1,2-DICHLOROTETRAFLUORO- (Refrigerant 114)	76-14-2	<100
*ETHANE, CHLOROPENTAFLUORO- (Refrigerant 115)	76-15-3	<60
*ETHANE, 2,2-DICHLORO-1,1,1-TRIFLUORO- (Refrigerant 123)	306-83-2	<100
*ETHANE, 2-DICHLORO-1,1,1,2- TETRAFLUORO- (Refrigerant 124)	2837-89-0	<100
PENTAFLUOROETHANE (HFC-125)	354-33-6	<70
ETHANE, 1,1-DIFLUORO- (Refrigerant 152a)	75-37-6	<30
*METHANE, BROMOTRIFLUORO- (Refrigerant 13B1)	75-63-8	<100
ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134a)	811-97-2	<100
ETHANE, 1,1,1-TRIFLUORO- (HFC-143a)	420-46-2	<55
PROPANE	74-98-6	<6
CONTAMINANTS		
REFINED MINERAL OILS	64742-52-5	<30
REFINED MINERAL OILS	64742-44-5	<30
REFINED MINERAL OILS	64741-88-4	<30
ALKYL BENZENE	68648-86-2	<30
OIL MIST IF GENERATED		
POLYALKYLENE GLYCOL OIL	9038-95-3	<30
POLYOL ESTER PLUS PHOSPHATE ESTER OIL		<30
POLYALKYLENE GLYCOL OIL	9003-13-8	<30

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

* 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.

Components (Remarks)

The above components represent DuPont Refrigerant and Refrigerant Blends that are returned for reclamation. Any (and/or all) components may be contained in the material returned. The information is representative for any and all components.

The specification for used refrigerant returned for reclamation is a maximum of 30% TOTAL lubricating oil content. Most used refrigerant contains significantly less.

HAZARDS IDENTIFICATION

Potential Health Effects

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. Causes skin and eye irritation.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure by skin contact may include skin irritation with discomfort or rash. Prolonged skin contact may cause temporary tingling, numbness, coldness or drying of skin. Skin contact with some components may cause frostbite. Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision. Eye contact with some components may cause "frostbite like" effects.

Inhalation may cause temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. Inhalation or ingestion may cause temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures 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. Suffocation, if air is displaced by vapors, can occur. Ingestion may cause nonspecific discomfort, such as nausea, headache, or weakness.

(HAZARDS IDENTIFICATION - Continued)

The major ingestion hazard is aspiration of the liquid into the lung which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma, and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after the exposure, depending on how much chemical entered the lungs.

REFRIGERANT 12:

Refrigerant 12 has been infrequently associated with skin sensitization in humans.

REFRIGERANT 152a:

Higher exposures (>20%) to Refrigerant 152a may lead to abnormal kidney function as detected by laboratory tests.

REFINED MINERAL OILS AND ALKYL BENZENE

Prolonged skin exposure to Refined Mineral Oils and Alkyl Benzene may defat skin and cause dermatitis. Ingestion may cause cramps and diarrhea.

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

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material	IARC	NTP	OSHA	ACGIH
REFINED MINERAL OILS	1		X	

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

(FIRST AID MEASURES - Continued)

Flush area with lukewarm water. Do not 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

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

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.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : >150 C (>302 F)

Pure Refrigerants will not burn. However, the lubricating oil contaminants will burn and they may be at a high enough concentration that the mixture will burn.

Fire and Explosion Hazards:

Drums 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 container. Self-contained breathing apparatus (SCBA) is required if drums rupture and contents are spilled 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. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Use self-contained breathing apparatus (SCBA) for large spills. Comply with Federal, State, and local regulations on reporting releases.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Use with sufficient ventilation to keep employee exposure below recommended limits.

Storage

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

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 and chemical splash goggles should be used if contact is possible.

RESPIRATOR

Where there is potential for airborne exposures in excess of applicable limits, wear NIOSH/MSHA approved respiratory protection.

Exposure Guidelines

(Applicable Exposure Limits - Continued)

PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
 WEEL (AIHA) : 1000 ppm, 4900 mg/m³, 8 Hr. TWA

ETHANE, 1,1-DIFLUORO-
 PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 1000 ppm, 8 Hr. TWA
 WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

METHANE, BROMOTRIFLUORO-
 PEL (OSHA) : 1,000 ppm, 6,100 mg/m³, 8 Hr. TWA
 TLV (ACGIH) : 1,000 ppm, 6,090 mg/m³, 8 Hr. TWA
 AEL * (DuPont) : None Established

ETHANE, 1,1,1,2-TETRAFLUORO-
 PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
 WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

ETHANE, 1,1,1-TRIFLUORO-
 PEL (OSHA) : None Established
 TLV (ACGIH) : None Established
 AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
 WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

PROPANE
 PEL (OSHA) : 1,000 ppm, 1,800 mg/m³, 8 Hr. TWA
 TLV (ACGIH) : 1000 ppm, 8 Hr. TWA
 AEL * (DuPont) : None Established

OIL MIST IF GENERATED
 PEL (OSHA) : 5 mg/m³, 8 Hr. TWA
 TLV (ACGIH) : 5 mg/m³, 8 Hr. TWA, STEL 10 mg/m³
 Notice of Intended Changes (2004)
 5 mg/m³, 8 Hr. TWA, (As sampled by
 method that does not collect vapors)
 AEL * (DuPont) : 5 mg/m³, 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

Odor : Slight ethereal
Form : Liquid, compressed gas, liquefied gas
Color : Clear, colorless, slightly yellow

STABILITY AND REACTIVITY

Chemical Stability

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

Incompatibility with Other Materials

Refrigerants are incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc. The Refined Mineral Oils are incompatible with strong oxidizers.

Decomposition

Decomposition products are hazardous. This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides. Refined Mineral Oils, if present, can produce carbon monoxide and carbon dioxide upon combustion.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

Animal Data

As a class of compounds, inhalation exposure to the individual refrigerants has caused the following toxic effects in animal testing:

Nervous system effects; anesthetic effects such as tremors, dizziness, incoordination, and loss of consciousness; irregular heartbeat; and cardiac sensitization (a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine).

In animal testing, some refrigerants caused altered blood pressure; decreased body weight; altered clinical chemistry; altered respiratory function; respiratory irritation;

(TOXICOLOGICAL INFORMATION - Continued)

increased liver weight; alterations in blood chemistry.

REFRIGERANT 11:

Inhalation 4-hour LC50: 26,200 ppm in rats
Oral ALD : 3,725 mg/kg in rats

In animals exposed to Refrigerant 11, various cardiovascular and circulatory abnormalities have been reported. Changes in the lungs, liver, brain and spleen were observed in a study of rats exposed by inhalation to 12 times the TLV.

REFRIGERANT 12:

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

ETHANE, 2-CHLORO-1,1,1,2-TETRAFLUORO- (HCFC-124):

4 hour Inhalation, ALC, rat: 230,000 - 300,000 ppm

REFRIGERANT 13:

Inhalation 2-hour LC50: >600,000 ppm in rats

REFRIGERANT 113:

Inhalation 4-hour LC50: 52,500 ppm in rats
Skin Absorption ALD : >11,000 mg/kg in rabbits
Oral LD50 : 43,000 mg/kg in rats

Refrigerant 113 produced weak allergic skin sensitization in a laboratory animal. High, single oral administration of the liquid, at or near lethal doses, produced lethargy within several minutes. In a reproductive toxicity study in rats with Refrigerant 113, no adverse effects on reproductive performance were seen at concentrations of 500 ppm, and only minimal effects (slight decrease in corpora lutea) were observed at 12,500 ppm.

CFC-114:

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

Repeated inhalation exposures to rats and mice at 200,000 ppm of Refrigerant 114 caused slight hematological effects and respiratory irritation.

REFRIGERANT 123:

Inhalation 4-hour LC50: 32,000 ppm in rats
Oral ALD : 9,000 mg/kg in rats
Skin Absorption LD50 : >2,000 mg/kg in rabbits

(TOXICOLOGICAL INFORMATION - Continued)

Repeated inhalation exposures to 300 ppm of HCFC-123 resulted in alterations in blood chemistry; Inhalation exposures above 300 ppm caused reduced lymphocyte counts, enzyme alterations, increased urinary fluoride concentration in rats; dogs demonstrated slight liver damage. HCFC-123 was not neurotoxic in animals repeatedly exposed by inhalation at concentrations up to 5,000 ppm, but did cause a slight decrease in arousal at this concentration. Inhalation of 300, 1000 or 5000 ppm HCFC-123 for two years caused an increase in benign testicular and benign pancreatic tumors in male rats; an increase in benign pancreatic tumors was observed in female rats exposed to 5000 ppm. In the same study, male and female rats exposed to 5000 ppm showed an increased incidence in benign liver tumors. Smaller increases in the incidence of these benign liver tumors were observed in females at 300 and 1000 ppm, while none were observed in female controls. The tumors were late-occurring and none were judged to be life-threatening. The biological significance of these tumors to man is considered to be limited. Additionally, evidence of retinal atrophy was observed in this two-year study in both treated and control animals, although the toxicological significance is undetermined. HCFC 123 does not produce genetic damage in bacterial cell cultures or in animals; however, in one study genetic damage was produced in mammalian cell cultures.

REFRIGERANT 22:

Inhalation 4-hour LC50: 220,000 ppm in rats

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). HCFC-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 HCFC-22, a concentration which also produced toxic effects in the adult animal. Based on these findings, and other negative developmental studies, HCFC-22 is not considered a unique hazard to the conceptus.

HFC-152a:

Inhalation 4-hour ALC: 383,000 ppm in rats
Oral ALD : >1,500 mg/kg in rats

(TOXICOLOGICAL INFORMATION - Continued)

Effects of repeated inhalation exposure to HFC-152a include increased urinary fluoride, reduced kidney weight, and reversible kidney changes.

REFRIGERANT 115:

Inhalation 4-hour LC50: >800,000 ppm in rats
Oral ALD : >1,200 mg/kg in rats

The effects of repeated ingestion of Refrigerant 115 include mild diarrhea, salivation and increased activity.

HFC-23:

Inhalation 1-hour LC50: >900,000 ppm (species unknown)

ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134a):

4 hour, ALC, rat: 567,000 ppm

Single inhalation exposure to near lethal doses caused pulmonary edema. Repeated exposure caused increased adrenals, liver, spleen weight; decreased uterine, prostate weight. Repeated dosing of higher concentrations caused tremors. In a two-year inhalation study, HFC-134a, at a concentration of 50,000 ppm, produced an increase in late-occurring benign testicular tumors, testicular hyperplasia and testicular weight. The no-effect-level for this study was 10,000 ppm. Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Reproductive data on male mice show: No change in reproductive performance. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. In animal testing, this material has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage).

REFRIGERANT 13B1:

Inhalation 1-hour LC50: >770,000 ppm in rats

Lung irritation and degeneration of the liver and kidneys were seen in animals exposed repeatedly by inhalation to lethal or near lethal concentrations of Refrigerant 13B1.

The acute Oral LD50 in rats for Refined Oil (CAS 64742-52-5) is >15 g/kg.

FC-143a:

Inhalation 4 hour LC50: > 540,000 ppm in rats

Two, 4-week inhalation studies of FC-143a have been

(TOXICOLOGICAL INFORMATION - Continued)

conducted. In the first study, pathological changes in the testes were observed at all exposure concentrations; no effects were observed in females. The testicular effect was considered related to the method used to expose the rats to HFC-143A. In the second study using the same exposure concentrations, no effects were noted in males at any concentration. Tests of FC-143a in bacterial cell cultures demonstrate mutagenic activity, but the compound did not induce oncogenic transformation of mammalian cells in culture. HFC-143A was not mutagenic in animals.

HFC-125:

INHALATION:

4 hour, ALC, rat: > 709,000 ppm

HFC-32:

4 hour inhalation, ALC, rat: > 520,000 ppm

Animal data on HFC-32 show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal.

DISPOSAL CONSIDERATIONS

Waste Disposal

Comply with Federal, State, and local regulations. Remove to a permitted waste disposal facility.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO/IATA

Proper Shipping Name: REFRIGERANT GASES, N.O.S.
(FLUORINATED HYDROCARBONS)

Hazard Class : 2.2

UN No. : 1078

DOT/IMO/IATA Label : NONFLAMMABLE GAS

Shipping Containers : Cylinders
Tank Cars
Tank Trucks

THE FOLLOWING SHIPPING DESCRIPTION IS FOR USED R-11, USED R-113, AND USED R-123 ONLY:

NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT, IMO, OR IATA.

(TRANSPORTATION INFORMATION - Continued)

Shipping Containers: Drums
Cylinders

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

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

LISTS:

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

*For Freon 11,12

**See component section

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 1
Flammability : 1
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